

EqualsEquals Language Reference

Final Report

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Introduction

Background && Goals

Current equation solving languages, such as R, Matlab, Mathematica, though powerful, still require users to have a basic understanding for programming. It is hard for young students in high school or college with no programming background to start using programming to solve the calculations from homework and textbooks. However, programming is extremely helpful when they have multiple variables and tens of equations when manually calculation is time consuming and error prone. Therefore, we truly think it will be great if we can create a programming language that helps students solve tedious and lengthy mathematical equations with very simple and flexible syntax. Our language EqualEqual targets to be an educational tool for students so that students can move their equations on their whiteboard to a EqualEqual program with as little change as possible. We believe that using programming to solve questions should not be an obstacle for students in their studies, and thus have students enjoyed more with their studies.

Language Evolution

EqualsEquals - "eqeq" for short - is a language designed for simple equation evaluation. EqualsEquals helps express mathematical equation in ASCII (though UTF-8 string literals are allowed) without straying too far from whiteboard-style notation. Users do not need to be overly careful to perfectly reduce formulas behind. Leaving unknowns for later is possible, without encapsulating equations' unknowns as function parameters. EqualsEquals takes multiple equations as input and can evaluate the value of a certain variables of the equations when the values of other variables are given.

Tutorial

Environment Setup

The compiler has been built and tested on OS X El Capitan, Ubuntu 15.10. The EqEq compiler Installation of Dependencies below:

Installation under Ubuntu 15.10

```
$ sudo apt-get install -y ocaml m4 opam
$ opam init
$ eval `opam config env`
```

Installation under OS X

```
$ brew install opam
$ opam init
$ eval `opam config env`
```

After OPAM is initialized, go to the the directory where you want EqEq installed and clone the git repository:

```
$ git clone https://github.com/rxie25/PLT2016Spring.git
```

Using the Compiler

Inside the directory of the cloned file

```
$ cd src
$ make
```

This creates the compiler for EqEq that takes in '.eq' files and compiles them to corresponding '.c' files as C code files. To run Eqeq executable is:

```
$ ./eqeq.native [options] < [your file name]
```

There are additional flags `-s` for printing the dependency table of the variables.

Basics and Syntax

Primitives

All primitive are declared with implicit types by an identification.

Operators

EqEq supports the following operators:

1. **Arithmetic:** +, -, /, *, ^, %, sin, cos, tan, sqrt, log, | ID |
eg.

```
SomeCtx = {  
  a = -42;  
  b = | a |; /* the value of b is 42 */  
  c = 2^2; /* the value of c is 4 */  
}
```

2. **Conditional:** ==, !=, <, <=, >, >=, &&, ||, !
3. **Other:** range

```
range(3);           // same as writing: {0, 1, 2, 3}  
range(-3);          // same as writing: {0, -1, -2, -3}  
range(2, 5);        // same as writing: {2, 3, 4, 5}  
range(8, 2, -3);    // same as writing: {8, 5, 2}
```

Control Structures

The statements inside source files are generally executed from top to bottom according to the appearance of `Find` blocks.

The execution order of multi-equations inside the `Context` blocks are determined and recomputed each time when one of the multi-equations inside the `Context` blocks changes. The order is determined by DFS with starting vertex of the current changed variable on the acyclic variable graph. The acyclic variable graph is stored as an adjacency list format that record the dependencies of each variable. A DFS is used to detect whether there is a cycle in the graph. If there is a cycle in the graph, an error will be raised, eg. `Cyclical dependency`.

Inside each multi-equation, the control flow statements break up the flow of execution by decision making statements (if-else, if-else if-else), looping statements (range, while) and branching statements (break, continue, return).

Decision Making

```

SomeContext = {
  a = { 42.333; }
}

SomeContext:find a {
  if (1) {
    a = 22;
  } else {
    a = 233;
  }
  /* a is now 22 */

  if (0) {
    a = 22;
  } else {
    a = 233;
  }
  /* a is now 233 */

  if (3>4){
    a = 3;
  }
  else if (4>3){
    a = 4;
    print("%.0f\n", a);
    /* the value of a is 4 */
  }
  else if (4>3){
    a = 4;
  }
  else{
    a =0;
  }
  print("%.0f\n", a);
  /* the value of a is 4 */
}

```

Loops

```

Foo = {
  a = 1;
  b = 3;
}

Foo: find a {
  while (a < 3) {
    print("%.0f\n", a);
    a = 3;
    /* the value of a = 3 now */
  }
}
/* it will print 1. */

Foo: find a with b in range(2); {

```



```
    print("a+b = %.0f\n", a + b);
}
/* the output will be 1, 2, 3 on separate lines. */
```

Branching

```
SomeContext = {
    a= 1;
}
SomeContext: find a{
    while(a<3){
        break;
        a = 2;
    }
    /* the value of a is still 1. */

    while(a<4){
        print("%.0f\n",a);
        a=a+1;
        continue;
        print("%.0f\n",a);
    }
    /* it will print 1, 2, 3 on separate lines. */
    /* the value of a now is 0. */
}
```

Example Programs

Definition of a Program

The simplest - though contrived - valid program is:

```
a = 42;
find a { printf("Hello, all %.0f readers!\n", a); }
```

Which prints the following to standard out: Hello, all 42 readers!

Formally, a valid program is a series of:

- one or more `find` blocks.
- zero or more "context" blocks (*aside from the automatic, global context*)

"Context"s & `find` Blocks

While both types of blocks of code are simply curly brace enclosed listings of sequential statements, contexts and `find` blocks differ in their use:

- `contexts` are expected to layout and define equations for use later. Thus they're allowed semantic gaps in their equations; eg: missing solutions.
- `find` blocks on the other hand are expected to be the resolution to "find" missing said pieces, or simply apply completed solutions to new inputs.

The `context` block consists of a list of single line and/or multi-line equations. The single line equations is expressed in assignment format.

```
SomeCtx = { a = 42; }
```

Multi-line equations, like single line equations, must be expressed in assignment format, but right hand side is express in `{*... multi-line statements ...*}`. In this case right hand side variable is treated as a variable. However nested `{()}` is considered illegal in eqeq.

```
Multi = {
  // multi-line equation life
  life = {
    if (a == 42) {
      a;
    } else {
      17;
    }
  }
}
```

```

    }
}

Multi: find life {
  a = 42;
  print("%.0f\n", life);
  /* prints out 42 */
}

```

It follows then that `find` expressions *apply* to contexts. Where a context might be shared for re-use, `find` expressions are designed to make local use of equations in a given context.

Though the above "Hello World" example executes a `find` on the global context, users will generally define contexts manually. For example a "Euclid" context, where `gcd` might be defined:

```

Euclid = { gcd = /*... defined here ...*/; }
Euclid: find gcd {
  a = 20; b = 10; print("%.0f\n", gcd);
}

```

Sample program

Below are example programs in EqualsEquals.

Example of Equations' `find` Use-cases

```

sum = 0 ; // initialize a number called sum
Pendulum = {
  /**
   * Spell out equation for our compiler:
   *  $m * g * h = m * v^2 / 2$ 
   */
  m = 10;
  theta = pi / 2;
  g = 9.8;
  h = l - l * cos(theta); // cosine, being a built-in
  v = (2 * g * h) ^ (1 / 2); // square root
  // note: relying on existing libraries for cos
}

// evaluate v in pendulum's equations given that g = 9.8 and l in range(20)
Pendulum: find v with l in range(0, 20); {
  // Our compiler now has solutions to: m, g, l (and indirectly h), so v can
  // be solved:

  print("velocity: %f", v);

  // v is automatically evaluated when it's referred to
}

```

```

}

// evaluate v in pendulum's equations given that g in range(4, 15) and l = 10
// take the average of values of v
Pendulum: find v with m = 100; g in range(4, 15); {
  l = 10;
  sum += v;
  // scope of sum: global (b/c it's not in the scope of pendulum but would be
  // overwritten by pendulum)
}

Pendulum: find v with v in range(20); {
  // throw a compiler error because can't find v with v's value
}

// Example: tries l = 10, v = 20 in context of pendulum, to see its equations
// are still true. If equations are inconsistent, the program will throw an
// exception.
Pendulum: find v {
  l = 10; // by now, v will be calculated
  print("%.0f", v == 20); // print 1
  v = 20; // throws an error
}

```

Example of a multi-line equation to find gcd of a and b

```

Gcd = {
  gcd = {
    a = 10;
    b = 20;
    while (a != b) {
      if (a > b) {a = a - b;}
      else {b = b - a;}
    }
    a; /* returns a back to gcd*/
  }
}

Gcd:find gcd {
/* evaluate gcd of 10 and 20 */
  a = 10;
  b = 20;
  print("gcd of %.0f and %.0f is %.0f\n", a, b, gcd);
}
/* END: Example of a multi-line equations to find gcd of a and b */

/* This works too. In this case, gcd is not in any special scope */
a = 1, b = 2;

// evaluate gcd of 10 and 20
find a {
  a = 10;
  print("a = %.0f and b = %.0f\n", a, b);
  /* print a = 10 and b = 2 */
}

```

```
}  
/* END: Example of a multi-line equations to find gcd of a and b */
```

Reference Manual

Introduction

EqualsEquals - "eqeq" for short - is a language designed for simple equation evaluation. EqualsEquals helps express mathematical equation in ASCII (though UTF-8 string literals are allowed) without straying too far from whiteboard-style notation. Users do not need to be overly careful to perfectly reduce formulas behind. Leaving unknowns for later is possible, without encapsulating equations' unknowns as function parameters. EqualsEquals takes multiple equations as input and can evaluate the value of a certain variables of the equations when the values of other variables are given.

Motivation

Reducing mathematical formulas can be really painful and tedious. We want to simplify the process of evaluating equations. With our language we take a step to help users leave their formula in a similar format to what they'd normally have on paper.

Overview

Valid source programs will compile down to C.

Definition of a Program

The simplest - though contrived - valid program is:

```
find { printf("Hello, all %.0f readers!\n", 21 * 2); }
```

Which prints the following to standard out: `Hello, all 42 readers!`

Formally, a valid program is a series of:

- one or more `find` blocks.
- zero or more "context" blocks (*aside from the automatic, global context*)

"Context"s & `find` Blocks

While both types of blocks of code are simply curly brace enclosed listings of sequential statements, contexts and `find` blocks differ in their use:

- **contexts** are expected to layout and define equations for use later. Thus they're allowed semantic gaps in their equations; eg: missing solutions.
- `find` blocks on the other hand are expected to be the resolution to "find" missing said pieces, or simply apply completed solutions to new inputs.

The `context` block consists of a list of single line and/or multi-line equations. The single line equations is expressed in assignment format.

```
SomeCtx = { a = 42; }
```

Multi-line equations, like single line equations, must be expressed in assignment format, but right hand side is express in `{*... multi-line statements ...*}`. In this case right hand side variable is treated as a variable. However nested `{}` is considered illegal in `eqeq`.

```
multi:{
  // multi-line equation life
  life = {
    if (a == 42) {
      a;
    } else {
      17;
    }
  }
}

multi: find life {
  a = 42;
  print("%.0f\n", life);
  //prints out 42
}
```

It follows then that `find` expressions *apply* to contexts. Where a context might be shared for re-use, `find` expressions are designed to make local use of equations in a given context.

Though the above "Hello World" example executes a `find` on the global context, users will generally define contexts manually. For example a "Euclid" context, where `gcd` might be defined:

```
Euclid = { gcd = /*... defined here ...*/; }
Euclid:find gcd {
  a = 20; b = 10; print("%.0f\n", gcd);
}
```

Design Implementation

Within contexts and `find` blocks, valid statements look like many C-style

languages, where expressions are semi-colon (;) separated, may have sub-expressions using parenthesis ((),) and the lexemes of an expression may be made up of:

1. **variables** to which floating-point numbers are assigned
2. **arithmetic** expressions: addition, subtraction, multiplication, division, exponents
3. **comments** characters ignored by the compiler
4. **white-space** to arbitrary length (eg: a = 3 is the same as a = 3)
5. **string** literals used for printing
6. **equality** operations in `if/else` expressions (*which evaluate to 1 or 0 if both operators are equal*)

Tokens: Expressions' Lexemes

Below is the syntax of each type of expression. For the semantic description of each, refer to the "[Declarations](#)" section, below.

1. Floating point numbers, including integers:

eg: 123, 1.34e-4, 0.23, .13, 0e1.

Described by the regular expression `flt` here:

```
let pos = ['1' - '9']           in
let dig = '0' | pos             in
let exp = ('e' | 'E') ('-' | '+')? pos+ in
let fra = '.' dig+ exp?        in
let num = pos dig*             in

let flt = num | ((num | 0)? fra) | (num exp)
```

2. Variable Assignment: numbers stored with user-defined names:

eg: `weight = 100 /*grams*/`

Described by the regular expression `var` here:

```
let aph = ['a'-'z'] | ['A'-'Z']   in

let var = aph+ ('_' | ['0'-'9'])*
```

3. Contexts: blocks of symbols:

eg: `Euclid: { /* any number of lines of EqualsEquals here */ }`

Building on variables' definition, the regular expression can be described by `ctx` here:

```
let ctx = ['A'-'Z'] var*
```


4. Strings: mostly used for printing results:

eg: `printf("result of my maths: %.0f\n", gcd)`

String literals can be described by the regular expression `str` here:

```
let chr = \x(0...9|A...F|a...f)(0...9|A...F|a...f) in
let spc = \(\n| \t| \b| \r| ' ' )
let num = ['0' - '9'] in
let aph = ['a' - 'z'] | ['A' - 'Z'] in

let str = (aph | num | chr | spc)*
```

Reserved Keywords

Following are reserved keywords, and have special meaning in the language. See "Statements" and "Declarations" sections elsewhere for each of their meanings.

- `if`
- `elif`
- `else`
- `find`
- `print`
- `Global`

Eseq is translated into C, so it has the same set of reserved keyword as in C in addition to the reserved keywords above.

- `int`
- `double`
- `char`
- `float`
- `const`
- `void`
- `short`
- `struct`
- `long`
- `return`
- `static`
- `swtich`
- `case`
- `default`
- `for`
- `do`
- `goto`
- `auto`
- `signed`
- `extern`
- `register`
- `enum`
- `sizeof`
- `typedef`

- union
- volatile

Declarations

1. A list of declarator are separated by comma. Formatted as below:

```
Declarator-list:
declarator, declarator, ...
```

For example:

```
a = 2, b = 3;
a = b, b = a % b;
```

2. Variable:

To declare a variable, only name of the variable is needed. The data types of the variables are inheritable.

Possible inherited data types:

- Double
- String

3. Multi-line equation: declaration of multi-line equation has the format:

```
equation_name = {
    // some operations
    var; // a variable, indicating equation_name's value
}
```

The `equation_name` has the type `Double`, where `var` indicates the name of variable expression holding the desired value. The equation will be passed by value. The multi-line equations, like regular equations, can only express one value.

For example:

```
gcd = {
    if (0 == b) {
        a; // solution is a
    } elif (a == 0) {
        b; // solution is b
    }

    if (a > b) {
        a = b, b = a % b;
        // note: multiple assignments on single line
    }
}
```

```

    } else {
      a = b % a, b = a;
    }
    gcd; // solution is gcd w/the current a and b
  }

```

This example results in an expression `gcd` - similar to a C-style function - that can be referred to later, given the necessary inputs `a` and `b` (in `eqeq`'s case, the right "context").

4. Equations:

```

variable = variable (value assigned?)
variable = some arithmetic expression
variable = { /*some multi-line equation that evaluates to a number*/ }

```

Only `variable` will be allowed on the left side of the equal sign. The expression on the right side can be a declared variable, an arithmetic expression that evaluates to a number, or a multi-line equation enclosed in curly-braces (see "Multi-line equation" above).

For example:

```

a = 3; b = a;           // b == 3
a = 3; b = a * 2 + 1;  // b == 7
a = 3; b = 6; c = gcd; // c == 3

```

For analysis of equation arithmetic, see "Expression Precedence & Meaning", below.

5. Scopes (access to variables):

```

VAR = EXPR;

Scope_name {
  list of equations

  // VAR = EXPR // overwrites global `VAR`
}

Scope_name: find VAR [with VAR_B in range()* ] {
  /** code here has access to `Scope_name`'s equations */
}

```

Here, `Scope_name` is like an object of equations. Equations are put inside the bracket follow `Scope_name`.

Any variable declared outside of a `Scope_name` is a global variable that can be accessed from anywhere within the program. It can evaluate any variable in the global context and overwrite the expressions in the global context. If a variable declared in some `Scope_name` has the same

name as some global variable, it will overwrite the value within the `Scope_name`. After getting out of the `Scope_name`, the variable will restore its value.

`Scope_name: find VAR [...]` is the evaluation part. A `with` clause is optional. See "With Statement" section below. `find` will evaluate the variable following it using the equations inside the `Scope_name` block. Once a `Scope_name` is defined, multiple `find` are allowed to use the equations inside it.

Statements

Expression Statement

Expression statements are statement that includes an expression and a semicolon at the end:

```
expression ;
```

Combining Statements

A statement can be the multiple of other statements. `{` and `}` are used to group multiple statements as one statement. So the form of compound statements is:

```
{ statement+ }
```

, which means that a compound statement has an opening curly bracket, one or more statements, and a closing curly bracket.

Conditional Statement

Statements that are used in conditional statements:

```
// if_statement  
if ( expression ) statement  
  
// elif_statement  
elif ( expression ) statement  
  
// else_statement  
else statement
```

Conditional statements have the following form:

```
if_statement elif_statement* else_statement?
```

, which means that it contains a required `if_statement`, any number of `elif_statement`, and an optional `else_statement`.

While Statement

While statements have the form:

```
while ( expression ) statement
```

The sub-statement is executed repeatedly so long as the value of the expression remains non-zero.

Break Statement

The statement

```
break ;
```

causes termination of the smallest enclosing `while`, or `with` statement.

Continue Statement

The statement

```
continue ;
```

causes control to pass to the loop-continuation portion of the smallest enclosing `while` or `with` statement; that is to the end of the loop. More precisely, in each of the statements.

Context statement

A context statement include a context name and a compound statement:

```
context_name compound_statement
```

To access a context, we use a statement with the following form:

```
context_name: statement
```

The sub-statement will be evaluated in the context given by `context_name`.

Examples:

```
mycontext {  
  x = 5;  
}
```

```
print(x); // throw an exception because x is not defined
mycontext: find x {
  print(x); // prints 5
}
```

With Statement

With statements have the form

```
with [variable in expression; ]+ compound_statement
```

, which means that with takes one or more expressions, and a compound sub-statement. (After each expression, a semicolon is needed after the expression.)

If the expressions have type double, then with will evaluate the expression and execute the compound sub-statement:

```
with x = 5; {
  print(x);
} // 5

with x = 5; y = 6; {
  print(x + y);
} // 11
```

Find Statement

Find statements start with keyword `find` and an expression, followed by a sub-statement:

```
find expression statement
```

In a find statement, the last statement should be evaluated with access to previously declared expressions.

Examples of find statements:

```
// a simple example
velocity = length + 1;

find velocity {
  length = 5;
  print(velocity);
} // print 6

// this block is the same as the one above
find velocity with length = 5; {
  print(velocity);
}
```

```

} // print 6

pendulum:find vector with length in range(0, 5); {
  print(velocity);
} // print 1 to 6

```

range()

`range()` mimics Python's `range()` function. It takes an optional expression `start`, an expression `stop`, and an optional expression `step`. It returns a vector from `start` to `stop - 1`, with distance `step` between each member of the vector:

```
range([start,] stop [,step]);
```

For examples,

```

range(3);           // same as writing: {0, 1, 2, 3}
range(-3);          // same as writing: {0, -1, -2, -3}
range(2, 5);        // same as writing: {2, 3, 4, 5}
range(2, 8, 3);     // same as writing: {2, 5, 8}

```

Range has to be the last argument in the find block.

For examples,

```

SomeCtx: find a with b = 3; c in range(3); {} // correct syntax
SomeCtx: find a with c in range(3); b = 3; {} // illegal syntax

```

Built-ins

print()

`print()` is built-in function that mirrors the C `printf()` API. `print()`'s arguments include a string, and optional expressions:

```
print( a_string_with_formatters [, expressions]* )
```

`print()` prints the formatted string to the screen.

Users can format strings in `print()` with `%f` and `%s` formatter (and but not `%d`, since `eqeq` only uses float). For example,

```

print("words here %f.0 and %f here\n", 4, myvar);
// words here 4 and 3.14159 here

```

Unlike the built-in functions below print function does not support any unary or binary operators.

```
-print("words here %f.0 and %f here\n", 4, myvar);  
// will throw the following error  
Fatal error: exception Failure("Illegal use of operator on print, "-")
```

sin()/cos()/tan()/sqrt()/log()

sin()/cos()/tan()/sqrt()/log() are built-in trigonometry and math functions that mirrors the same functions in C

under `math.h` library. Their arguments include variable names and numbers only. Nested built-in functions are allowed.

Numerical range for sqrt()\log() and is confined to greater or equals to zero and greater than zero respectively and are checked statically at compile time. Like most imperative language illegal argument for the above built-in functions cannot be caught at compile time for variables, will will be reported at C runtime.

```
a = cos(sin(tan(log(sqrt(42)))));
```

functions can be nested like the example above.

Expression Precedence & Meaning

Here various expressions' meanings are described, generally shown as `expr`, in the order of their precedence.

- `(' expr ')`: for sub-expressions. For example, `expr` of `4 + 5` here:

```
b * (4 + 5); // `expr` should be considered first  
b * 9;      // same as above; note absence of parenthesis
```

- `-expr`: negative. The result is the negative of the expression. Note, the type of the expression must be double.
- `!expr`: logical negation.

The result of the logical negation operator `!` is `1` if the value of `expr` is `0`. If the value of `expr` is anything other than `0`, then `!expr` results in `0`.

- `left_expr ^ right_expr`: exponentiation. Mathematically raises `left_expr` to the power, `right_expr`. Note: uses underlying C standard library's corresponding power API, eg: `double pow (double base, double power)`.
- `expr * expr, expr / expr` The binary operator `*` / indicates multiplication and division operation. If both operands are double, the result is double.
- `expr % expr` The binary `%` operator yields the remainder from the division

of the first expression by the second. Both operands are double, and only integer portion of the double will be used for modular operation, and the result is a double with fraction equals to zero. eg:

```
12.0 % 7.0 = 5.0;
12.3 % 7.5 = 5.0;
```

- `expr + expr`, `expr - expr` The result is the sum or different of the expressions. Both are double, the result is double.
- equality/inequality:
 - `expr > expr`, `expr >= expr`, `expr < expr`, `expr <= expr` The operators `<` (less than), `>` (greater than), `<=` (less than or equal to) and `>=` (greater than or equal to) all yield 0 if the specified relation is false and 1 if it is true. Operand conversion is exactly the same as for the `+` operator.
 - `expr != expr`, `expr == expr`: The `!=` (not equal to) and the `==` (equal to) operators are exactly analogous to the relational operators except for their lower precedence. (Thus `a < b == c < d` is 1 whenever `a < b` and `c < d` have the same truth-value).
- `expr || expr` The `||` operator returns 1 if either of its operands is non-zero, and 0 otherwise. It guarantees left-to-right evaluation; moreover, the second operand is not evaluated if the value of the first operand is non-zero.
- `expr && expr` The `&&` operator returns 1 if both of its operands is non-zero, and 0 if either is 0. It guarantees left-to-right evaluation; moreover, the second operand is not evaluated if the value of the first operand is 0.
- `left_expr = right_expr`: assignment. the `left_expr` must be a single variable expression. The result of this operation is that `left_expr` holds the value of `right_expr` going forward. If `right_expr` contains unknown variables, the `left_expr` will not be solvable until a `find` block expresses a solution in terms of `left_expr` and provides any missing variables from the `right_expr`.
- `expression , expression` A pair of expressions separated by a comma is evaluated left-to-right and the value of the left expression is discarded. The type and value of the result are the type and value of the right operand.

Sample program

Below are example programs in EqualsEquals.

Example of equations' `find` Use-cases

```

sum = 0 // initialize a number called sum
pendulum {
  /**
   * Spell out equation for our compiler:
   *  $m * g * h = m * v^2 / 2$ 
   */
  m = 10;
  theta = pi / 2;
  g = 9.8;
  h = l - l * cos(theta); // cosine, being a built-in
  v = (2 * g * h) ^ (1 / 2); // square root
  // note: relying on existing libraries for cos
}

// evaluate v in pendulum's equations given that g = 9.8 and l in range(20)
pendulum: find v with l in range(0, 20) {
  // Our compiler now has solutions to: m, g, l (and indirectly h), so v can
  // be solved:

  print("velocity: %f", v);

  // v is automatically evaluated when it's referred to
}

// evaluate v in pendulum's equations given that g in range(4, 15) and l = 10
// take the average of values of v
pendulum: find v with m = 100; g in range(4, 15); {
  l = 10;

  sum += v;
  // scope of sum: global (b/c it's not in the scope of pendulum but would be
  // overwritten by pendulum)
}

average = sum / (15 - 4);

pendulum: find v with v in range(20); {
  // throw a compiler error because can't find v with v's value
}

// Example: tries l = 10, v = 20 in context of pendulum, to see its equations
// are still true. If equations are inconsistent, the program will throw an
// exception.
pendulum: find v {
  l = 10; // by now, v will be calculated
  print(v == 20); // print 1
  v = 20; // throws an error
}

```

Example of a multi-line equation to find gcd of a and b

```

Gcd = {
  gcd = {
    a = 10;

```

```

    b=20;
    while (a != b) {
        if (a > b) {a = a - b;}
        else {b = b - a;}
    }
    a; /* returns a back to gcd*/
}

Gcd:find gcd {
/* evaluate gcd of 10 and 20 */
    a = 10;
    b = 20;
    print("gcd of %.0f and %.0f is %.0f\n", a, b, gcd);
}
/* END: Example of a multi-line equations to find gcd of a and b */

/* This works too. In this case, gcd is not in any special scope */
gcd = {
    ... // same as the above example
}

// evaluate gcd of 10 and 20
find gcd {
    a = 10;
    b = 20;
    print("gcd of %.0f and %.0f is %.0f\n", a, b, gcd);
}
/* END: Example of a multi-line equations to find gcd of a and b */

```

Project Plan

Roles and Responsibilities

We assigned four main roles Manager, Language Guru, System Architect, Testers to each member on the team. As we developed our language, the role were not that clearly divided. The team would help each other when we ran into particularly difficult problems, and assign each other pull request to review before merge. The table below illustrates the main roles and one example of a part we contributed heavily in.

Name	Responsibilities
Nam Hoang	Language Guru, Code Generation
Tianci Zhong	Manager, Semantic Analysis, Code Generation
Ruicong Xie	Tester, Semantic Analysis
Lanting He	Tester, Code Generation
Jonathan Zacsh	System Architect, Semantic Analysis

Timeline

Time	Events
Jan 25	First Commit
Jan 25	Submitted Project Proposal
Mar 7	Submitted Language Reference Manual
Mar 27	First Travis CI Build
Mar 31	Successfully Generated Code (“Hello World”)
April 25	Major Language Features Complete
May 7	Variable Dependency Resolved
May 9	Presentation Presentation

May 11 Time	Project Submission Events
----------------	------------------------------

Specification

At the beginning of the semester we had the idea to make a physics language. Later we realized a lot of the problem we have to solve are just mathematical equations. That's when we had the idea to make EqEq, a mathematical language that solves equations. However we later found symbolic mathematical manipulate was too broad of a topic to tackle, so we scaled our compiler back to variable resolution in mathematical equation.

Development

We first worked together on `scanner.mll`, `parser.mly` and `ast.ml`, as no one on our team had any prior experience with OCaml. Our first milestone was to make a very basic scanner, parser, and generator. We built up the basic pipeline for automated testing on Travis CI. Whenever we worked on a new feature, we would create a new branch and open a pull request to merge with master. No pull request was accepted unless it passed all of the tests and was reviewed by one of the team members. Once we had a simple hard-coded version of `hell-world.eq` working with our compiler, we quickly decided to split into smaller groups to tackle some more difficult problems, like multiple-line equations, context resolution, variable dependency, etc. We initially added semantic analysis and a naive version of variable mapping for scope and variable resolution. However we soon realized the problem is more complex, and built `relation.ml` a variable dependency table to deal with the problem, in which we used DFS to detect cyclic references.

Testing

While developing the code, we concurrently tested what we wrote. When we initially developed our language we had `debugtokenizer.ml` and `debug_frontend.py` to test the front end of our language. The first program splits out correct recognized tokens when fed with source code in `eqeq`, while the second one runs the tokens through `parser.ml` with `menhir`. After we finished the bulk of the front end of our compiler, we set up automated testing on Travis CI with `.travis.yml` to test if our language is compiling properly for each commit. All the testing suite and processes will be discussed in detail later in the testing section of this report.

Software Development Environment

Programming Language Stack

- Git Repository Hosted on Github for version control which contains the compiler code and test suite
- OCaml for scanning, parsing, and semantically checking `eqeq` source code and generation of C target code output
- Bash Shell Scripts for running our program given an input `eqeq` file (`.eqeq`) and an output C file (`.c`) file, as well as automating testing

- Makefile for all things compiling, linking, and test related

Tools

- Travis CI for automated continuous integration testing through Github to make sure no new code modifies the correct functionality of the language
- Sublime, Atom, Vim for text editing, depending on each team member's preference

Programming Style Guide

While programming, all group members followed these following style guidelines to ensure our project stayed consistent:

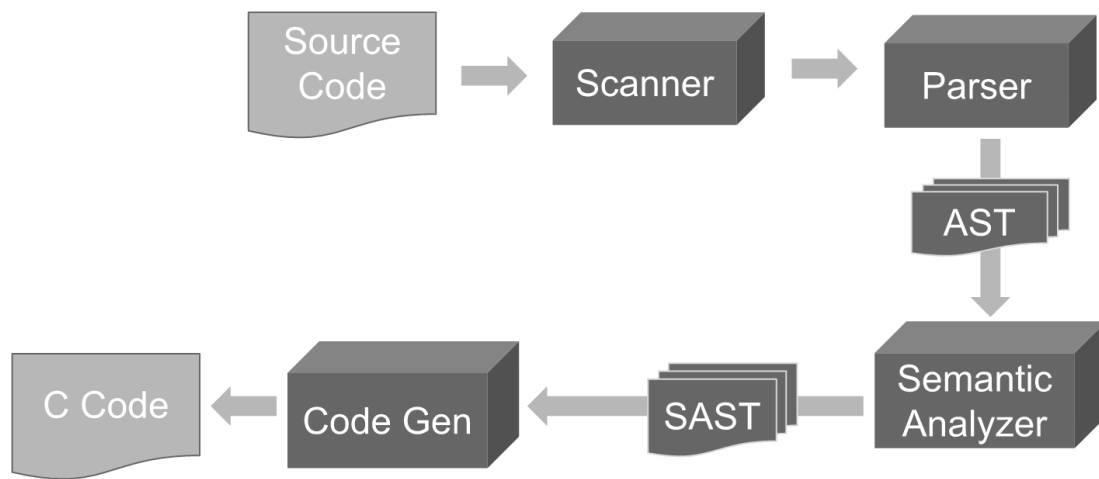
- Lines of code should not be more than 80 characters
- No tabs for indentation
- Indentation is always 4 spaces
- Naming consistency between the different program files
- Newline at the end of each file
- One line between each declaration block
- White space for readability

Translator Architecture

The compiler is, of course, built in OCaml. The architecture of the compiler is demonstrated in the block diagram below. Our compiler source code includes 8 files:

- `epeq.ml` - main module that calls other modules to produce the output
- `ast.ml` - AST (abstract syntax tree) representation of the language
- `sast.ml` - SAST (semantically checked AST) representation of the language
- `scanner.ml` - tokenizes a source file
- `parser.ml` - constructs an AST from the output tokens of the scanner
- `semant.ml` - checks the incoming AST to make sure that the AST is semantically correct, and produces a SAST
- `relation.ml` - an extension of `semant.ml`, used to generate a large part of the SAST
- `codegen.ml` - converts a SAST into a working C code

Compiler Architecture



In summary, the source code is passed through the scanner and parser to create an Abstract Syntax Tree, which then went through the Semantic Analyzer to create an modified AST (aka. SAST). The C code is generated from the SAST using a code generator.

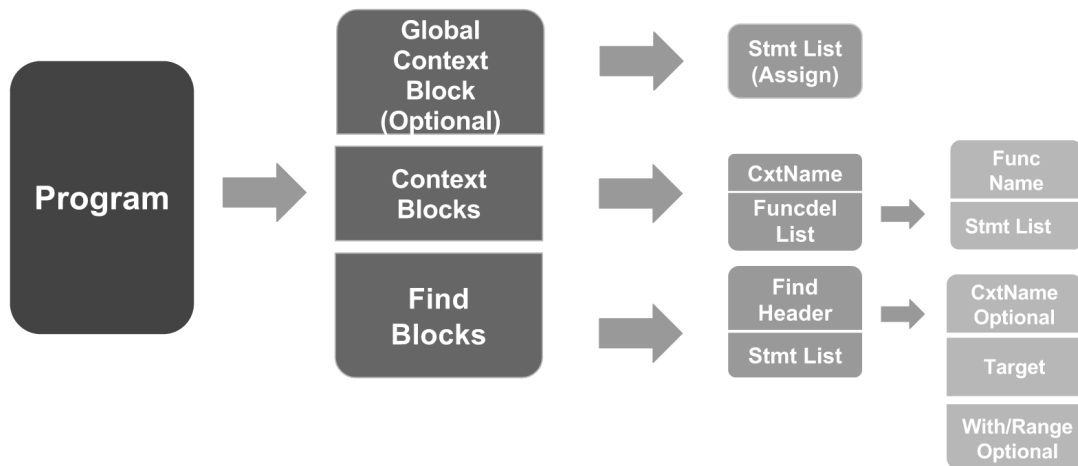
Scanner

The scanner tokenizes the input from the input file. Additionally, it discards unnecessary characters and check the syntax of the program.

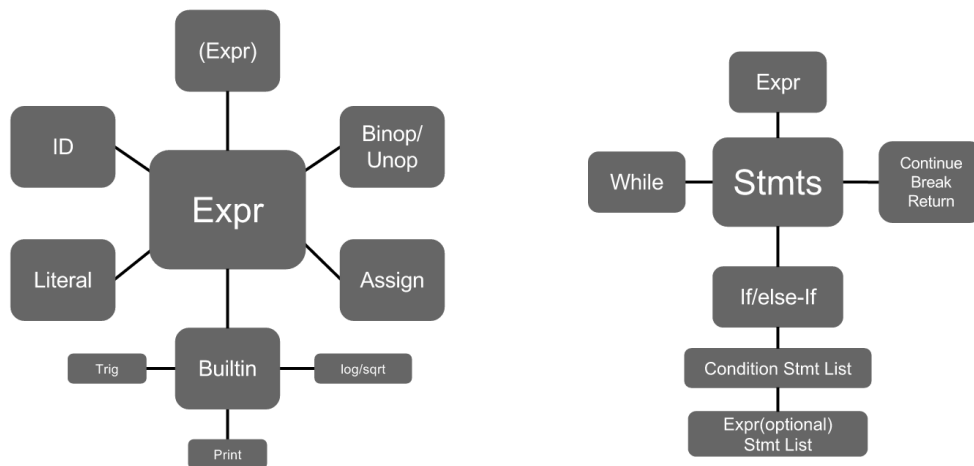
Parser

The parser constructs an abstract syntax tree (AST) with the input token from the scanner. The highest level of the AST contains a global context block, all context blocks and all find blocks. The following figure demonstrates the main structure of the AST. The parser also further checks the syntax of the program. The combination of the parser and the scanner makes sure that the input program is syntactically correct.

Parser



AST



Semantic Analyzer

The semantic analyzer has two main jobs. The first one is to check for all the semantic errors of the program. The following semantic errors are checked in our compiler:

- Illegal usage of reserved keyword, e.g: break
- Illegal usage of duplicate context block
- Illegal usage of mathematical equation, e.g: cos(3,4,5)
- Lower case Context name
- Bad syntax of if / if-elseif /if-else
- Undeclared variables and undeclared context
- Illegal use of build-in function (e.g: `print("%0.0f ", a)-print("%0.0f ", a);range(3, 5, "abc")`)
- Illegal return
- Illegal find block declaration
- Cyclic dependency

The second job of the semantic analyzer is taking the parser's AST and producing an SAST. Our SAST contains the AST, a multi-line equation dependency structure, a context variable map, and a library list.

- **Multi-line equation dependency structure** - At the high level, the multi-line equation dependency structure can be understood as a structure of graphs where each node is a variable, and each edge is the dependency between two variables. The multi-line equation dependency structure contains all the variables that are declared for each context block and its corresponding find blocks. The structure indicates whether a variable is dependent on other variables or not. If a variable x is independent of other variables, the structure shows the expression assigned to x . If a variable y is independent of other variables, the structure shows the list of variables that y depends on.
- **Context variable map** - This is a structure that contains information of the variables for each context. The generator uses the information provided by the context variable map to generate definitions for variables (e.g. "double x;") and to match the name of the variables with the corresponding names in the generated code in C (e.g. a variable a in context `MyCtx` could be named as `MyCtx_a_<counter_number_to_avoid_duplicates>`).
- **Library list** - This is a list of strings that contains everything in the running EqualEqual program that calls C library functions (e.g: `cos()` will call `math.h` and `print()` will call `stdio.h`). In `Codegen.ml` we will scan through this list and include the corresponding C libraries in the generated C code.

Code Generator

The code generator uses the SAST provided by the semantic analyzer to construct the `c` instructions for the `egeq` program.

- **Global context and context blocks** - Multi-line equations in both global context and context blocks are generated as functions in the output C program. The return value of a function will be the the result of the multi-line equation. To be unique, a function name includes the corresponding context name and a counter (e.g. `MyCtx_a_0()`).
- **Find blocks** - Find blocks are generated as a function in the output C program (e.g. `find_MyCtx_1()`). In find blocks, variables that are defined and used locally will be assigned to the corresponding functions in global context (e.g. `a = MyCtx_a_0(b, d);`).
- **Dependency Generation** - The multi-line equations are resolved when a new variable is declared. The functions needed to be regenerated will be generated using the multi-line equation dependency structure, as mentioned in the above section (Semantic Analyzer). Since efficiency is not a priority, the dependency generation might generate duplicated assignments.
- **Range** - `Range` function are generated by wrapping around the generated find function with a outside for loop function

```
SomeCtx:find a with b = 10; c in range(0,2);{
    *****
}
```

```
void find_SomeCtx_0_range(){
    double c;
    for(c=0.000000; c<=3.000000; c=c+1.000000){
        find_SomeCtx_0(c);
    }
}
```

Utilities

The compiler can generate pretty-print strings for AST and SAST with flags `-a` and `-s`. The printed AST and SAST show us the output of the program through different phases and help debugging much faster.

Test Plan

EqEq compiler has had *passing* end-to-end tests from the start - from the moment a basic "hello world" was compiling.

Test Strategies: `make e2e`

Our compiler uses two types of test-coverage: the main tests via `make test` and extraneous tests, via `make lint`

1. `make test`: this runs every `tests/{test, fail}-*.eq` file through the compiler - `epeq.native` - and for each:

test file	<code>epeq.native</code> exit status	compared outputs
<code>test-NAME.eq</code>	0 (zero)	resulting target program output matches <code>test-NAME.out</code> golden sample
<code>fail-NAME.eq</code>	<code>!= 0</code> (non-zero)	<code>./epeq.native</code> error matches <code>fail-NAME.err</code> golden sample

2. `make lint`: anything general to *building* our compiler

eg: early on, this ensured our scanner/parser phase didn't produce `shift-reduce` warnings (*at one point, accidentally ignored*)

Policy: Changes Must be Tested

Each change to the compiler - feature or bug-fix - was explicitly required to be committed with a **new** test file before being merged into `master`. In fact, the official recommended steps to work on the compiler states:

before creating [your new change] write tests for it [and] **ensure it FAILS**

When developing, members relied on `make test`'s report to look for their new test's red or green "FAIL"/"PASS" indicator. This single testing command (`make test`) ran all of the compiler's existing tests as well. The benefit of this approach was that, other team members could focus solely on their own feature's side-effect and get immediate, unsolicited feedback in the event of an inadvertent regression.

Automation: `master` Must Pass

The compiler's github codebase is configured to send each `master` commit (including merges) to the popular automated test runner travis-ci.org for a `make e2e` run. This means we all knew immediately if someone made a mistake and merged their in-progress work from an experimental branch, into `master`, before it was ready. This came in handy more than once, where we were able to simply revert the offending merge and get `master` passing again (*facilitating others to keep branching for the next milestone*).

Strong Coverage

As a result, the compiler's codebase currently has over **120 test-EqualsEquals programs**, that run with every merge.

Lesson Learned

Tianci

Coordinating a team is hard and communication between team members is important. Appreciate and learn from the diverse background of teammates. OCaml is a great language for writing compiler.

Jimmy

Importance of having a seamless workflow and communication when collaborating for large scale development.

Also don't be afraid to tackle bigger problems.

Jon

Make no assumptions about what people do/don't agree on. People don't like to speak up and say so when something is confusing (which, in turn, causes slowdown). That is, get everyone on the same page - even on the basics, like version control.

Nam

Some important lessons I learned from the projects:

- Meeting is very important for everyone to get on the same page and learn from others. It was hard for everyone on our team to meet, but I think that meeting will help a lot even when not everyone can come to the meeting.
- Thinking about the architecture of the compiler and fix all the edge cases as soon as possible (edge cases take a lot of time).
- Designing the language with one good application of the language in mind.

Lanting

Learned a lot from great teammates, it is great for people to work on the things they are good at.

Conclusions

As stated at the beginning, EqualEqual aims to provide students an easy tool to solve lengthy and error-prone mathematical equations. With all the features we mentioned above, we believe that EqualEqual has succeeded in becoming such a user-friendly and smart language. Due to the time manner, we are not able to have it been extremely powerful. However, We expect it to be more powerful, e.g: solve complex variable circular dependency functions, in the future by using more sophisticated algorithms.

Full Code Listing

Project Log

```
commit 9a9b6c7d21997a77ddd28636dcaafca4f5329c16
Author: Jonathan Zacsh <jzacsh@gmail.com>
Date:   Wed May 11 23:47:17 2016 -0400
```

```
remove accidentally pasted `set -x` output
```

```
notes/final-report.md | 6 -----
1 file changed, 6 deletions(-)
```

```
commit 676f912356e3883669fc5c1064ef291c6a710ff2
Author: Nam Hoang <nnh2110@columbia.edu>
Date:   Wed May 11 23:47:09 2016 -0400
```

```
I was being stupid and copying the codes to the final report
```

```
notes/final-report.md | 1531 +-----
1 file changed, 1 insertion(+), 1530 deletions(-)
```

```
commit 65afaedf8c5e805cd80a056a40f2ea859d817fc6
Author: Tianci Zhong <tz2278@columbia.edu>
Date:   Wed May 11 23:34:08 2016 -0400
```

```
clean up comment for lanting and jimmy
```

```
notes/final-report.md | 14 ++++++-----
1 file changed, 7 insertions(+), 7 deletions(-)
```

```
commit 300f0ff912890423852752d6378ae6c9f88cfd88
Author: Tianci Zhong <tz2278@columbia.edu>
Date:   Wed May 11 23:29:13 2016 -0400
```

```
update tianci's lesson learned
```

```
notes/final-report.md | 2 +-
1 file changed, 1 insertion(+), 1 deletion(-)
```

```
commit b545bf68108cc90aeae95a90fb93b0a87df92644
Author: Jonathan Zacsh <jzacsh@gmail.com>
Date:   Wed May 11 23:27:26 2016 -0400
```

```
just dumped output of ./report/lrm.sh directly (no changes to it)
```

```
`./lrm.sh` just cats the lrm itself, and upgrades all the header levels.
```

```
notes/final-report.md | 686 +-----
1 file changed, 682 insertions(+), 4 deletions(-)
```

```
commit 3f8739c48265750dd0b094b8663aa7f0bbd71363
Author: Tianci Zhong <tz2278@columbia.edu>
Date:   Wed May 11 23:25:54 2016 -0400
```

```
update lanting lesson learned
```

```
notes/final-report.md | 4 +---
1 file changed, 2 insertions(+), 2 deletions(-)
```

```
commit c23d487ef65b6779e104e85405e14abelcxbd508
Author: Tianci Zhong <tz2278@columbia.edu>
Date:   Wed May 11 23:21:32 2016 -0400
```

```
clean Tianci-DRI
```

```
notes/final-report.md | 6 +++---
1 file changed, 3 insertions(+), 3 deletions(-)
```

```
commit 795f51e9ad50a05655d3c428e27f983c4e477b08
Author: Nam Hoang <nnh2110@columbia.edu>
Date:   Wed May 11 23:19:27 2016 -0400
```

```
lessons learned
```

```
notes/final-report.md | 7 ++++++-
```

```
1 file changed, 6 insertions(+), 1 deletion(-)

commit 10d36abc3747b6fb2d37f481f0bfdfff43ceefc7
Author: Tianci Zhong <tz2278@columbia.edu>
Date: Wed May 11 23:19:13 2016 -0400

    update tianci's lesson learned

notes/final-report.md | 4 +++-
1 file changed, 3 insertions(+), 1 deletion(-)

commit ee9e74ea33ab291e32be191568c79aba82d6be47
Author: Tianci Zhong <tz2278@columbia.edu>
Date: Wed May 11 23:11:24 2016 -0400

    update control flow part

notes/final-report.md | 93 ++++++-----
1 file changed, 90 insertions(+), 3 deletions(-)

commit 84a0104e6c08c1c0d3eae1c2cd8d5bde2cadf790
Author: Nam Hoang <nnh2110@columbia.edu>
Date: Wed May 11 23:08:15 2016 -0400

    update code && embedding some css

notes/final-report.md | 1310 ++++++-----
1 file changed, 1309 insertions(+), 1 deletion(-)

commit 7ff413ecec2c4012096a82cfe40a71e339574c82
Author: Jonathan Zacsh <jzacsh@gmail.com>
Date: Wed May 11 23:07:56 2016 -0400

    doc: for my finished sections of final-report, mark done

notes/final-report.md | 9 ++++++--
1 file changed, 7 insertions(+), 2 deletions(-)

commit b459de682b0d9eb4e324e20f9e52937a6610530e
Author: Nam Hoang <nnh2110@columbia.edu>
Date: Wed May 11 22:28:21 2016 -0400

    add some images for the final report

notes/final-report.md | 2 +-
notes/img/2016-05-11_17:49:10.png | Bin 0 -> 47729 bytes
notes/img/2016-05-11_17:49:51.png | Bin 0 -> 65502 bytes
notes/img/2016-05-11_17:50:13.png | Bin 0 -> 47973 bytes
4 files changed, 1 insertion(+), 1 deletion(-)

commit 49fdc06fa65ab6572296e5a6cc5abdf39910e69e
Author: Jimmy Xie <rxie25@gmail.com>
Date: Wed May 11 22:27:27 2016 -0400

    pulled out vector, updated gcd

notes/language-reference-manual.md | 72 ++++++-----
1 file changed, 14 insertions(+), 58 deletions(-)

commit 1f8a6ecbe8d0b5cb73ce97f45cffa404f84d2f58
Author: Nam Hoang <nnh2110@columbia.edu>
Date: Wed May 11 22:20:56 2016 -0400

    delete LRM for Jon; add code

notes/final-report.md | 846 ++++++-----
1 file changed, 315 insertions(+), 531 deletions(-)

commit a49aaed73dd3a86b973cd2806d318a91a5819640
Author: Jonathan Zacsh <jzacsh@gmail.com>
Date: Wed May 11 22:18:14 2016 -0400

    (doc) per nam request: copy/paste `testing.md` into final-report.md

notes/final-report.md | 58 ++++++-----
notes/report/testing.md | 43 -----
2 files changed, 54 insertions(+), 47 deletions(-)

commit 66eb50812b427ac93c2c70c3fb6b61817729ad3a
Author: Ruicong Xie <rx2119@columbia.edu>
Date: Wed May 11 22:14:57 2016 -0400

    rec gcd wont pass use iterative one
```



```
notes/final-report.md | 26 ++++++-----
1 file changed, 10 insertions(+), 16 deletions(-)

commit 9cdc6d1c09a2933a1a3af0d019e54celf1114762
Author: Ruicong Xie <rx2119@columbia.edu>
Date:   Wed May 11 22:12:10 2016 -0400

    vector out

notes/final-report.md | 43 +++-----
1 file changed, 4 insertions(+), 39 deletions(-)

commit f6a80fa82134b06ac601798f70ce74db0434faea
Author: Tianci Zhong <tz2278@columbia.edu>
Date:   Wed May 11 22:06:04 2016 -0400

    minor fix in tutorial part

notes/final-report.md | 142 +-----
1 file changed, 2 insertions(+), 140 deletions(-)

commit 837491992794dee3451d96b39f3f760cdafec02e
Author: Tianci Zhong <tz2278@columbia.edu>
Date:   Wed May 11 21:57:56 2016 -0400

    update example code

notes/final-report.md | 38 ++++++-----
1 file changed, 16 insertions(+), 22 deletions(-)

commit 6f5a3f8844a8d88ededa90b34326acd27355a2ae
Author: Tianci Zhong <tz2278@columbia.edu>
Date:   Wed May 11 21:50:14 2016 -0400

    update tutorial part

notes/final-report.md | 21 ++++++-----
1 file changed, 17 insertions(+), 4 deletions(-)

commit d85e319b87dc3a56bcdf473875be59aaf1ec12ad
Author: Ruicong Xie <rx2119@columbia.edu>
Date:   Wed May 11 21:25:49 2016 -0400

    corrected a typo

notes/final-report.md | 2 +-
1 file changed, 1 insertion(+), 1 deletion(-)

commit d9be4df183e5b65aea8991e62b1d0ff1b06da7c9
Author: Tianci Zhong <tz2278@columbia.edu>
Date:   Wed May 11 21:24:25 2016 -0400

    update tutorial part

notes/final-report.md | 14 ++++++-----
1 file changed, 8 insertions(+), 6 deletions(-)

commit 8c8a4885d52bc3dc806af5d1a20f1eb98e5fc64a
Author: Ruicong Xie <rx2119@columbia.edu>
Date:   Wed May 11 21:21:36 2016 -0400

    updated codegen for range

notes/final-report.md | 16 ++++++-----
1 file changed, 15 insertions(+), 1 deletion(-)

commit a30038c442c374d88aa49a58fef9dd2ed3c0723
Author: kekeleila <lh2756@barnard.edu>
Date:   Wed May 11 21:15:56 2016 -0400

    Liblist functions

notes/final-report.md | 2 +-
1 file changed, 1 insertion(+), 1 deletion(-)

commit 0aaf13ac12304233ba822d616ccf427a9c7f6e48
Author: Nam Hoang <nnh2110@columbia.edu>
Date:   Wed May 11 21:03:38 2016 -0400

    code generation and utilities

notes/final-report.md | 31 ++++++-----
```

```
1 file changed, 19 insertions(+), 12 deletions(-)

commit falfla5d4910f00ca62253c7c3950e62189ee9e2
Author: Tianci Zhong <tz2278@columbia.edu>
Date: Wed May 11 20:57:33 2016 -0400

    update tutorial part

notes/final-report.md | 158 ++++++-----
1 file changed, 156 insertions(+), 2 deletions(-)

commit 7ddc24513b8dbef56730baf8f480a7653e964fc5
Author: Nam Hoang <nnh2110@columbia.edu>
Date: Wed May 11 18:58:19 2016 -0400

    writing architecture section

notes/final-report.md | 42 ++++++-----
1 file changed, 41 insertions(+), 1 deletion(-)

commit 9148982c5ee7003ald35fdc6b04264762b746018
Author: Nam Hoang <nnh2110@columbia.edu>
Date: Wed May 11 17:40:27 2016 -0400

    add headers that was somehow deleted and fix typo

notes/final-report.md | 19 ++++++-----
1 file changed, 16 insertions(+), 3 deletions(-)

commit d5bdc2ef9634862581b4225aaa87a47a8d32da3
Author: Jonathan Zacsh <jzacsh@gmail.com>
Date: Wed May 11 17:28:31 2016 -0400

    bug fix: n00b ocaml mistake; ref is not a value

src/relation.ml | 2 +-
1 file changed, 1 insertion(+), 1 deletion(-)

commit 4c997116aec1700ca762789e3cf38b18812302e5
Author: Jonathan Zacsh <jzacsh@gmail.com>
Date: Wed May 11 14:57:03 2016 -0400

    update roles to reflect bulk of commits

Overall, we all had our hands in everything. In the large, however, here's my thought process for this commit:
- I wrote all of relation.ml, which is the crux of our language's claim to semantic analysis
- Tianci did a lot to touch base and follow up on open github issues and things that weren't getting done, so I t
- I setup the skeleton of every file and the tests, so I gave myself "Architect"
- Nam did the majority of the codegen work for our equation dependencies (again: the crux of our language's desig

notes/final-report.md | 10 +++++-----
1 file changed, 5 insertions(+), 5 deletions(-)

commit b0f8124ef8c794b138403ea7ec89479bea3ebfc1
Author: Ruicong Xie <rx2119@columbia.edu>
Date: Wed May 11 10:21:15 2016 -0400

    corrected a few typo

notes/final-report.md | 14 ++++++-----
1 file changed, 7 insertions(+), 7 deletions(-)

commit 35f59257380d4340a59f95faa4f2fd7b17c9ce76
Author: Ruicong Xie <rx2119@columbia.edu>
Date: Wed May 11 10:16:32 2016 -0400

    table formatted correctly

notes/final-report.md | 1 +
1 file changed, 1 insertion(+)

commit 25d0a8ae4a2783dfe8e4992f06dfeeaf46e844c4
Author: kekeleila <lh2756@barnard.edu>
Date: Wed May 11 08:52:19 2016 -0400

    Update report.md

    Add intro && conclusion

notes/final-report.md | 10 ++++++-----
1 file changed, 8 insertions(+), 2 deletions(-)

commit 6c16429f514e423323d1bddd07ccdebb7174c997
```

Author: Tianci Zhong <tz2278@columbia.edu>
Date: Wed May 11 03:56:05 2016 -0400

fix final-report update

notes/final-report.md | 21 ++++++-----
1 file changed, 12 insertions(+), 9 deletions(-)

commit 3aed47121d0038d92370d1919bd0c19ce21bc8b3
Author: Tianci Zhong <tz2278@columbia.edu>
Date: Wed May 11 03:54:13 2016 -0400

update final report

notes/final-report.md | 24 ++++++
1 file changed, 24 insertions(+)

commit d1ef0563c946da0711a2b653a6ddb21666c3f5a8
Author: Jonathan Zacsh <jzacsh@gmail.com>
Date: Tue May 10 18:07:43 2016 -0400

failing test to capture buggy behavior

currently we get:

```
$./eqeq.native < tests/test-range-dependents-bug.eq  
Fatal error: exception Failure("Cyclical dependency under, "magiceq"; stopped at ID="magiceq")  
^^^
```

src/tests/test-range-dependents-bug.eq | 7 ++++++
src/tests/test-range-dependents-bug.out | 6 ++++++
2 files changed, 13 insertions(+)

commit 37062031ce8e435af15995ba2a5daa7bf8adb8e5
Author: Ruicong Xie rx2119@columbia.edu
Date: Mon May 9 23:11:36 2016 -0400

planning section almost done

notes/final-report.md | 51 ++++++-----
1 file changed, 35 insertions(+), 16 deletions(-)

commit f0ea672526adea18c336de7d7128e8c19b030926
Author: Jonathan Zacsh jzacsh@gmail.com
Date: Mon May 9 17:53:17 2016 -0400

bug fix: de-dup list of deps before adding to tree

src/relation.ml | 14 ++++++-----
1 file changed, 9 insertions(+), 5 deletions(-)

commit 247b0319b263cd6537c062a0223a4b18145aff04
Author: Jonathan Zacsh jzacsh@gmail.com
Date: Mon May 9 17:49:01 2016 -0400

tdd: unskip test showing bug in equation dependency graph

src/tests/test-double-dependency-bug.eq | 8 ++++++
src/tests/test-double-dependency-bug.skip.eq | 8 -----
2 files changed, 8 insertions(+), 8 deletions(-)

commit 03a30f665e88361ca9ae0ac145e61cfa328387bc
Author: Jonathan Zacsh jzacsh@gmail.com

Date: Mon May 9 17:47:44 2016 -0400

bug: add test coverage for bug in sast that group found before presentation

src/tests/test-double-dependency-bug.out | 1 +
src/tests/test-double-dependency-bug.skip.eq | 8 ++++++++
2 files changed, 9 insertions(+)

commit ca6e47192f40fe392606405db243641aa2f6a5a7
Author: Nam Hoang nnh2110@columbia.edu
Date: Mon May 9 17:26:09 2016 -0400

fix all warnings and comment out info/debug stuff

src/codegen.ml | 12 ++++-----
src/semant.ml | 47 ++++++-----
2 files changed, 19 insertions(+), 40 deletions(-)

commit 395ed7a6018e31eb3a2a4352d880b33a4fc464a4
Author: Nam Hoang nnh2110@columbia.edu
Date: Mon May 9 17:13:57 2016 -0400

add test for presentation

src/tests/test-presentation.eq | 18 ++++++
src/tests/test-presentation.out | 3 +++
2 files changed, 21 insertions(+)

commit 1a26d7b9617507a6587c64ba73f143ed85f18026
Author: Nam Hoang nnh2110@columbia.edu
Date: Mon May 9 14:31:00 2016 -0400

(bug fix) fix the conflict between `range` and the current codegen
ready for presentation!

src/codegen.ml | 18 ++++++
src/tests/test-range.eq | 34 ++++++
2 files changed, 50 insertions(+), 2 deletions(-)

commit 3bd771a7562f70bcbee6b0428f496395d0176eef
Author: Ruicong Xie rx2119@columbia.edu
Date: Mon May 9 03:29:47 2016 -0400

switch typo

src/scanner.mll | 8 ++++
1 file changed, 4 insertions(+), 4 deletions(-)

commit 6905058b1baf93544ccd3cc943626a34854e456
Author: Ruicong Xie rx2119@columbia.edu
Date: Mon May 9 03:27:00 2016 -0400

in progress

notes/final-report.md | 32 ++++++-----
1 file changed, 7 insertions(+), 25 deletions(-)

commit 6049d19ec15b7dcc9fb71d66e4494c9391c9a667
Author: Jonathan Zacsh jzacsh@gmail.com
Date: Mon May 9 01:24:23 2016 -0400

unskip passing tests as of 267ba6bff & 6ed71f91a

src/tests/fail-undef-var-with-def-target.eq | 12 ++++++
src/tests/fail-undef-var-with-def-target.skip.eq | 12 -----
src/tests/test-lazyresolved-vars-nested-assignment.eq | 9 ++++++
src/tests/test-lazyresolved-vars-nested-assignment.skip.eq | 9 -----
4 files changed, 21 insertions(+), 21 deletions(-)

commit 6ed71f91aa223cbeafb10bce09b828307ae6bc
Author: Jonathan Zacsh jzacsh@gmail.com
Date: Mon May 9 01:20:19 2016 -0400

test bug: error messaging has evolved; but test is identical

src/tests/fail-undef-var-with-def-target.err | 2 +-
1 file changed, 1 insertion(+), 1 deletion(-)

commit 267ba6bff97fcf1b7f1cf33462b44e0e69676d2f
Author: Jonathan Zacsh jzacsh@gmail.com
Date: Mon May 9 01:19:18 2016 -0400

test bug: yet another incorrect test output

src/tests/test-lazyresolved-vars-nested-assignment.out | 2 +-
1 file changed, 1 insertion(+), 1 deletion(-)

commit 808648f4ca7a5b7114dccb4624cd4c03d6f1734
Author: Jonathan Zacsh jzacsh@gmail.com
Date: Mon May 9 00:58:01 2016 -0400

merges from master & unskips & splits in half test

...t-lazyresolved-vars-increment-dependent-self.eq | 13 ++++++
...-lazyresolved-vars-increment-dependent-self.out | 3 +++
src/tests/test-lazyresolved-vars-increment-self.eq | 15 ++++++
.../test-lazyresolved-vars-increment-self.out | 9 +++-----
.../test-lazyresolved-vars-increment-self.skip.eq | 23 -----
5 files changed, 34 insertions(+), 29 deletions(-)

commit 141184d6993187fd916bf1a71ad4ec3cfe0bc361
Author: Jonathan Zacsh jzacsh@gmail.com
Date: Mon May 9 00:44:18 2016 -0400

test-bug: incorrect expected test output

src/tests/test-lazyresolved-vars-increment-self.out | 6 +++---
1 file changed, 3 insertions(+), 3 deletions(-)

commit e90669e5962e31a3900d9a1b9817280533ea66f7

Author: Jonathan Zacsh jzacsh@gmail.com

Date: Mon May 9 00:12:53 2016 -0400

make warnings a bit easier to see/notice when in `make test` dev-loop

src/Makefile | 8 ++++++--

1 file changed, 6 insertions(+), 2 deletions(-)

commit ce4e2f0cc2f279baf770979f0b248247351e0eac

Author: Jonathan Zacsh jzacsh@gmail.com

Date: Mon May 9 00:10:09 2016 -0400

fixes #87: implement `range` eq-deps analysis

src/relation.ml | 79 +++-----

src/semant.ml | 2 +-
2 files changed, 68 insertions(+), 13 deletions(-)

commit 87d215cb6f77a0234f49a6b1966820bbe1cddb1f

Author: Jonathan Zacsh jzacsh@gmail.com

Date: Sun May 8 22:38:13 2016 -0400

in case this script is used again, give final PDF a nicer font

notes/lrm-to-pdf.sh | 2 +-
1 file changed, 1 insertion(+), 1 deletion(-)

commit 5f0069157d3708746f8f030a424a002252532adf

Author: Jimmy Xie rxie25@gmail.com

Date: Sun May 8 22:29:06 2016 -0400

project plan still in progress

notes/final-report.md | 46 +++-----

1 file changed, 43 insertions(+), 3 deletions(-)

commit 38cf7ee5a77e9b7c1122df43a5003901b3f8b7c

Author: Jonathan Zacsh jzacsh@gmail.com

Date: Sun May 8 22:19:53 2016 -0400

unskip newly passing test as of d9000fa7c65f; tested this time via `make e2e`

src/tests/test-multiple-context-per-var.eq | 15 ++++++

src/tests/test-multiple-context-per-var.skip.eq | 15 -----

2 files changed, 15 insertions(+), 15 deletions(-)

commit d57ebb5f70a3744eb1386d2b634b54393a370397

Author: Jonathan Zacsh jzacsh@gmail.com

Date: Sun May 8 22:14:54 2016 -0400

noop(readability) DRY-up if/else/{if/else} repetition

slow/dumb evolution of d9000fa7c65f64 left a bit duplicated code in two places that need to be kept in sync.

src/relation.ml | 20 ++++++-----
1 file changed, 7 insertions(+), 13 deletions(-)

commit d9000fa7c65f642d9e06402d156f97ee8880d7
Author: Jonathan Zacsh jzacsh@gmail.com
Date: Sun May 8 22:07:53 2016 -0400

bug fix: sast API promised re-assignment never lands in deps-table

technically sast was corret before, but the API of SAST was *supposed* to
guarantee that new dependent multi-line equations could never appear during
'find'-decl analysis of an ASSIGN.

src/relation.ml | 24 ++++++-----
1 file changed, 16 insertions(+), 8 deletions(-)

commit 744a93627a9b19db7f2e6a6b97589f968a37291c
Author: Jimmy Xie rxie25@gmail.com
Date: Sun May 8 21:49:33 2016 -0400

Update final-report.md

notes/final-report.md | 26 ++++++-----
1 file changed, 12 insertions(+), 14 deletions(-)

commit 8d22ee0d9bd7768bcd58656b4fedea034389d823
Author: Ruicong Xie rx2119@columbia.edu
Date: Sun May 8 21:40:57 2016 -0400

adding sections

notes/final-report.md | 19 ++++++-----
1 file changed, 19 insertions(+)

commit bcff13eae7f38b840ea1129929636576bbce6c5a
Author: Ruicong Xie rx2119@columbia.edu
Date: Sun May 8 21:07:40 2016 -0400

reformated test for clarity

src/tests/test-recursive-gcd.skip.eq | 6 +++---
1 file changed, 3 insertions(+), 3 deletions(-)

commit 6a223b6e0f338a32f323c0f63d4952a7e6fa2a87
Author: Ruicong Xie rx2119@columbia.edu
Date: Sun May 8 20:22:25 2016 -0400

updated test

src/tests/test-recursive-gcd.skip.eq | 38 ++++++-----
1 file changed, 16 insertions(+), 22 deletions(-)

commit de77237e4d70d0ca190b0d4024f4c6135b49c0e3
Author: Jonathan Zacsh jzacsh@gmail.com
Date: Sun May 8 20:06:45 2016 -0400

report: easily include latest LRM content, but downgrade header levels

notes/report/lrm.sh | 6 ++++++
1 file changed, 6 insertions(+)

commit 0c7046cb98bb8d59157ebcec36e5098eb2936261
Author: Ruicong Xie rx2119@columbia.edu
Date: Sun May 8 19:12:43 2016 -0400

corrected gcd test from LRM

src/tests/test-recursive-gcd.out | 1 +
src/tests/test-recursive-gcd.skip.eq | 29 ++++++
2 files changed, 30 insertions(+)

commit 346d251e1b6e7582d73e8c7172a1a1a75062dfac
Author: Jonathan Zacsh jzacsh@gmail.com
Date: Sun May 8 18:53:20 2016 -0400

doc: first-pass at final report "testing" section
fixes one of my bullets in #95

notes/report/testing.md | 43 ++++++
1 file changed, 43 insertions(+)

commit fbb6e79672468a9511b1491f929bcc7563a3799c
Author: Nam Hoang nh2110@columbia.edu
Date: Sun May 8 16:45:55 2016 -0400

final report structure and responsibilities

notes/final-report.md | 765 ++++++
1 file changed, 765 insertions(+)

commit 9f2e04e561a69970fa98e1acd018a8269ffbed
Author: Jonathan Zacsh jzacsh@gmail.com
Date: Sat May 7 19:31:31 2016 -0400

noop: layout where to add `range` analysis

src/relation.ml | 14 ++++++
src/semant.ml | 11 +++++-
src/tests/test-range.eq | 52 ++++++
src/tests/test-range.skip.eq | 52 -----
4 files changed, 70 insertions(+), 59 deletions(-)

commit bedadde69026dfb38164fe14b016edffb8bf0ee5
Author: Jonathan Zacsh jzacsh@gmail.com
Date: Sat May 7 17:54:19 2016 -0400

closes issue 92 by forking `find` analysis

context analysis[1] is nearly identical to find decl analysis[2]; difference is
we collected all the unresolvable variables, and use them as indication of an
equations dependence

[1]: see `ctxBodyRelator`
[2]: see `findStmtRelator`

src/relation.ml | 168 ++++++-----
1 file changed, 108 insertions(+), 60 deletions(-)

commit 5f1409baacfeff68efa804cfc15d955a86f49772
Author: Jonathan Zacsh jzacsh@gmail.com
Date: Sat May 7 12:26:32 2016 -0400

Revert "fix 71875fe broken test output (not a bug - just bad test file)"

This reverts commit d4949db0a1d8de90e4875b353088b316aa076d26. so confused.
somehow test output *was* correct...

src/tests/test-dependency-resolved-inside-function.out | 2 +-
1 file changed, 1 insertion(+), 1 deletion(-)

commit 93a4599ecf4d213601c5ecaa9687ed776661a6f1
Author: Nam Hoang nnh2110@columbia.edu
Date: Thu May 5 22:16:35 2016 -0400

if this test passes, everything else in this branch should pass
a test that cover the basic cases of the current pull request

src/tests/test-overwritten-lazyresolved-vars.eq | 15 ++++++
src/tests/test-overwritten-lazyresolved-vars.out | 3 +++
2 files changed, 18 insertions(+)

commit 18a3eb8160feaab1376664b6989b575b20d29970
Author: Nam Hoang nnh2110@columbia.edu
Date: Thu May 5 22:11:07 2016 -0400

iterate through deps, indeps with expr_number
solve problem with `test-lazyresolved-vars`

src/codegen.ml | 103 ++++++-----
src/tests/test-lazyresolved-vars.eq | 4 +-
2 files changed, 86 insertions(+), 21 deletions(-)

commit 8158a77a98c55b7aa5fc74d4455b5541998c7a3b
Author: Jonathan Zacsh jzacsh@gmail.com
Date: Thu May 5 19:51:23 2016 -0400

noop/refactor: cont'd alpha-renaming from 231ef13b

src/relation.ml | 20 ++++++-----
1 file changed, 10 insertions(+), 10 deletions(-)

commit 231ef13bf69e9c860244b1f89302564401965b20
Author: Jonathan Zacsh jzacsh@gmail.com
Date: Thu May 5 18:55:36 2016 -0400

noop(refactor) outline where bug fix should live

High-level: currently `relationCtxFolder` does its own dumb walk of contexts'
equations, but the highly developed version in `findStmtRelator` is what we

want.

Nitty details:

1. shares `findStmtRelator` code as a new internal API
2. existing `find` decl analysis (`findStmtRelator`) to new, thin wrapper
3. creates 2nd, thin wrapper for no.2, intended for `context` decl walks

src/relation.ml | 20 ++++++++
1 file changed, 16 insertions(+), 4 deletions(-)

commit c3691b4c1b0aa379d7fa004773e1c8e35a430413
Author: Jonathan Zacsh jzacsh@gmail.com
Date: Thu May 5 17:23:01 2016 -0400

fix bug: context dep tree did not maintain exclusive dep/indep split

src/relation.ml | 11 ++++++
1 file changed, 9 insertions(+), 2 deletions(-)

commit cb47379acbef06e1338eb6ac6a38c810f896bfcb
Author: Jonathan Zacsh jzacsh@gmail.com
Date: Thu May 5 16:19:28 2016 -0400

noop(readability) rename internal var so it is easier to read `./eqeq.native -s` output

src/tests/test-dependency-resolved-inside-function.eq | 4 ++
1 file changed, 2 insertions(+), 2 deletions(-)

commit d4949db0a1d8de90e4875b353088b316aa076d26
Author: Jonathan Zacsh jzacsh@gmail.com
Date: Thu May 5 16:18:54 2016 -0400

fix 71875fe broken test output (not a bug - just bad test file)

src/tests/test-dependency-resolved-inside-function.out | 2 +-
1 file changed, 1 insertion(+), 1 deletion(-)

commit 71875febf93d0fb2713867710e37fa79a5a5a894
Author: Jonathan Zacsh jzacsh@gmail.com
Date: Thu May 5 16:17:48 2016 -0400

add test code showing multi-line equation deps

copy/pasted directly from
https://github.com/rxie25/PLT2016Spring/pull/91#discussion_r62119363

src/tests/test-dependency-resolved-inside-function.eq | 11 ++++++++
src/tests/test-dependency-resolved-inside-function.out | 1 +
2 files changed, 12 insertions(+)

commit 173ea8a8c5bcfb27f516088e6dbfc8acefb086ec
Author: Jonathan Zacsh jzacsh@gmail.com
Date: Thu May 5 15:44:26 2016 -0400

doc: moves TODO higher-level: why our AST has a list of ranges when we can only have one

src/ast.ml | 1 +

src/semant.ml | 1 -
2 files changed, 1 insertion(+), 1 deletion(-)

commit d7dd1d378c0ba0b6efee063087af1bcee69a9c28
Author: Nam Hoang nnh2110@columbia.edu
Date: Thu May 5 02:43:52 2016 -0400

noop: fix indentation because it made me so confused

src/semant.ml | 40 ++++++-----
1 file changed, 20 insertions(+), 20 deletions(-)

commit d4134b1a35bae266885507a17c852a90e1ca02ee
Author: Nam Hoang nnh2110@columbia.edu
Date: Thu May 5 02:39:47 2016 -0400

new: generate declarations for new variables in `find`

solve problems with test-find-decl-assignment.eq
TODO:
- problem with `sast`:
 - test-iterative-gcd
 - test-dependency-resolved...
- iterate through deps, indeps with expr_number
 - test-lazyresolved-vars

src/codegen.ml | 28 ++++++---
src/tests/test-lazyresolved-vars.eq | 3 +-
2 files changed, 27 insertions(+), 4 deletions(-)

commit 0fd2fcba08d0884f02ca53327a6135a78e73f9aa
Author: Nam Hoang nnh2110@columbia.edu
Date: Wed May 4 17:35:08 2016 -0400

debug && add a simple test that breaks current `sast`

src/codegen.ml | 6 +++++-
src/tests/test-dependency-resolved-inside-function.eq | 11 ++++++
src/tests/test-dependency-resolved-inside-function.out | 1 +
src/tests/test-lazyresolved-vars.eq | 1 +
4 files changed, 18 insertions(+), 1 deletion(-)

commit 87376de4ba1f59d036eb2ec0c5ffee6e0331f0c6
Author: Nam Hoang nnh2110@columbia.edu
Date: Tue May 3 23:49:00 2016 -0400

implement multieq assignments in `finds` with `sast`

still have some bugs to fix

src/codegen.ml | 73 ++++++-----
src/semant.ml | 15 ++++++----
2 files changed, 53 insertions(+), 35 deletions(-)

commit 12ffcaf1b5ff77f3729b02dd7b0c900524c7b0d8
Author: Nam Hoang nnh2110@columbia.edu
Date: Tue May 3 20:07:15 2016 -0400

refactor to get the name of `findfunc` separately

shouldn't change any logic

src/codegen.ml | 28 ++++++-----
1 file changed, 17 insertions(+), 11 deletions(-)

commit e29be2bb769bb600723592fe08ce703f2c4f85dd
Author: Nam Hoang nnh2110@columbia.edu
Date: Tue May 3 13:04:24 2016 -0400

incorporate sast into generating functions for contexts
TODO: put sast in generate finds

src/codegen.ml | 68 ++++++-----
1 file changed, 48 insertions(+), 20 deletions(-)

commit dab7881f9a323aa7043df22c7b221643666e5e10
Author: Nam Hoang nnh2110@columbia.edu
Date: Tue May 3 12:02:41 2016 -0400

write expected output for the test

src/tests/test-lazyresolved-vars.eq | 50 ++++++-----
1 file changed, 50 insertions(+)

commit b7d87761c782c3a44ede67efb9d7e154af8e7092
Author: Nam Hoang nnh2110@columbia.edu
Date: Tue May 3 12:00:17 2016 -0400

unskip tests

src/tests/test-find-decl-assignment.eq | 8 ++++++
src/tests/test-find-decl-assignment.skip.eq | 8 -----
src/tests/test-lazyresolved-vars.eq | 15 ++++++-----
src/tests/test-lazyresolved-vars.skip.eq | 15 -----
4 files changed, 23 insertions(+), 23 deletions(-)

commit e9fb8313e60fed9def56383a22ccb79020315730
Author: Tianci Zhong tz2278@columbia.edu
Date: Tue May 3 11:50:57 2016 -0400

modified lrm and modified test for global variable

notes/language-reference-manual.md | 36 ++++++-----
src/scanner.mll | 2 +-
src/semant.ml | 4 +-
src/tests/test-findblk-without-ctx.eq | 12 ++++++
src/tests/test-findblk-without-ctx.out | 3 ++
src/tests/test-global-variable-overwrite.out | 2 ++
src/tests/test-global-variable-overwrite.skip.eq | 12 ++++++
src/tests/test-global-variable.out | 2 ++
src/tests/test-global-variable.skip.eq | 11 ++++++
src/tests/test-global.out | 2 --
src/tests/test-global.skip.eq | 11 -----
src/tests/test-globalctx.eq | 12 -----
src/tests/test-globalctx.out | 3 --
13 files changed, 76 insertions(+), 36 deletions(-)

commit a42a3d41a6ffce8f0b0cb14d96bb60ef796b3279
Author: Ruicong Xie rx2119@columbia.edu
Date: Sun May 1 14:52:10 2016 -0400

test gcd and fixed return bug in multi-eq

src/codegen.ml | 41 ++++++-----
src/tests/test-iterative-gcd.eq | 16 ++++++
src/tests/test-iterative-gcd.out | 1 +
3 files changed, 41 insertions(+), 17 deletions(-)

commit 9dc3adc630142269d60e8c408818bdf3b00a4254
Author: Jonathan Zacsh jzacsh@gmail.com
Date: Sat Apr 30 21:29:50 2016 -0400

better error messages: indicate which argument is erroneous

src/semant.ml | 16 ++++++-----
src/tests/fail-range-with-string-passedin-end-param.err | 2 +-
.../fail-range-with-string-passedin-increment-param.err | 2 +-
.../fail-range-with-string-passedin-start-param.err | 2 +-
4 files changed, 11 insertions(+), 11 deletions(-)

commit 948184291a348ba5ef4ed78c06018796e1d8f3f7
Author: Jonathan Zacsh jzacsh@gmail.com
Date: Sat Apr 30 21:27:04 2016 -0400

adds test coverage for existing analysis of increment param

src/tests/fail-range-with-string-passedin-increment-param.eq | 8 ++++++
src/tests/fail-range-with-string-passedin-increment-param.err | 1 +
2 files changed, 9 insertions(+)

commit 43552146d05c030f38057050fc6aff13415f42b4
Author: Jonathan Zacsh jzacsh@gmail.com
Date: Sat Apr 30 21:20:23 2016 -0400

noop(readability) meaningful test name (rather than "test-N")

src/tests/fail-range-with-string-passedin-end-param.eq | 9 ++++++
src/tests/fail-range-with-string-passedin-end-param.err | 1 +
src/tests/fail-range-with-string-passedin-start-param.eq | 9 ++++++
src/tests/fail-range-with-string-passedin-start-param.err | 1 +
src/tests/fail-range-with-string-passedin.eq | 9 -----
src/tests/fail-range-with-string-passedin.err | 1 -
src/tests/fail-range-with-string-passedin1.eq | 9 -----
src/tests/fail-range-with-string-passedin1.err | 1 -
8 files changed, 20 insertions(+), 20 deletions(-)

commit 102a9bdd65296ccf3fa6479eac1b7c71ef92bee2
Author: Jonathan Zacsh jzacsh@gmail.com
Date: Sat Apr 30 21:17:46 2016 -0400

noop(readability) rewrite `range` digging and add TODO about ignoring the list

src/semant.ml | 42 ++++++-----

src/tests/fail-range-with-string-passedin.err | 2 +-
src/tests/fail-range-with-string-passedin1.err | 2 +-
3 files changed, 29 insertions(+), 17 deletions(-)

commit dc390812f428b2094d256412cee745f9c9d94e2e
Author: Tianci Zhong tz2278@columbia.edu
Date: Fri Apr 29 13:39:40 2016 -0400

clean up trailing whitespace

src/parser.mly | 4 ++--
src/semant.ml | 20 ++++++++-----
2 files changed, 12 insertions(+), 12 deletions(-)

commit a764a643755d5a233e26a5f79e8103983cc7be02
Author: Tianci Zhong tz2278@columbia.edu
Date: Fri Apr 29 13:21:39 2016 -0400

skip the test-global

src/semant.ml | 9 ++++++---
src/tests/test-global.eq | 11 -----
src/tests/test-global.skip.eq | 11 ++++++++
3 files changed, 17 insertions(+), 14 deletions(-)

commit 2e4b1855d56508780f07c8c168fed3c8823c7843
Author: Tianci Zhong tz2278@columbia.edu
Date: Thu Apr 28 23:01:38 2016 -0400

change test

src/tests/test-global.eq | 3 ++-
src/tests/test-global.out | 3 +-
src/tests/test-globalctx.eq | 8 ++++++-
src/tests/test-globalctx.out | 2 ++
4 files changed, 12 insertions(+), 4 deletions(-)

commit 66a9924df2df1ddf856201591a13cb1ae1ac9311
Author: Tianci Zhong tz2278@columbia.edu
Date: Thu Apr 28 22:46:11 2016 -0400

change skipped test

src/parser.mly | 16 ++++++-----
src/semant.ml | 44 ++++++++-----
src/tests/test-global.eq | 12 +++-----
src/tests/test-globalctx.eq | 6 ++++++
src/tests/test-globalctx.skip.eq | 6 -----
5 files changed, 41 insertions(+), 43 deletions(-)

commit 69fa2a314f9b020cb85cf02b46e4ed41bf9352b3
Author: Jonathan Zacsh jzacsh@gmail.com
Date: Thu Apr 28 19:26:07 2016 -0400

remove deadcode in Makefile; cleanup doc

src/Makefile | 9 +++++----
1 file changed, 5 insertions(+), 4 deletions(-)

commit 4bb98f04e7f5bdeaa9ebd35b0d15a6e95cbfa4fe
Author: Jonathan Zacsh jzacsh@gmail.com
Date: Thu Apr 28 19:05:13 2016 -0400

```
tell `printf` builtin it is gettiga float
```

src/bin/e2e-tests.sh | 2 +-
1 file changed, 1 insertion(+), 1 deletion(-)

commit 54dd10ab64316280a5a7ba16bfee1645ff5d1f37
Author: Jonathan Zacsh jzacsh@gmail.com
Date: Thu Apr 28 18:55:26 2016 -0400

```
fix some bad math (and make sure `bc` uses floating point)
```

src/bin/e2e-tests.sh | 2 +-
1 file changed, 1 insertion(+), 1 deletion(-)

commit 1d51a2f28762deed99581eba52a737d77f6669ce
Author: Jonathan Zacsh jzacsh@gmail.com
Date: Thu Apr 28 18:48:31 2016 -0400

```
doc(typo) s/not/know/
```

src/README.md | 2 +-
1 file changed, 1 insertion(+), 1 deletion(-)

commit 6a1182ed173043ebe88df6ca54faf48f545f20ef
Author: Jonathan Zacsh jzacsh@gmail.com
Date: Thu Apr 28 18:46:50 2016 -0400

```
doc: english was a little funky..
```

src/README.md | 12 ++++++-----
1 file changed, 6 insertions(+), 6 deletions(-)

commit 0219c6dce65077d6b92d4022c5be95970e651cda
Author: Jonathan Zacsh jzacsh@gmail.com
Date: Thu Apr 28 18:41:47 2016 -0400

```
doc: update TOC for main README w/new section
```

src/README.md | 7 ++++++-
1 file changed, 6 insertions(+), 1 deletion(-)

commit e499a9d2d4256040e9a26f86ca133d32762beb56
Author: Jonathan Zacsh jzacsh@gmail.com
Date: Thu Apr 28 18:34:32 2016 -0400

```
doc: quick guide on how to test quickly
```

```
(for those who haven't lookedat at `bin/e2e-tests.sh -h`)
```

src/README.md | 33 ++++++
1 file changed, 33 insertions(+)

commit 985293954e2fdc4fe17da82fec868e08b877cf3
Author: Tianci Zhong tz2278@columbia.edu
Date: Wed Apr 27 21:30:24 2016 -0400

add multi-eq in global to all contexts

src/semant.ml | 10 +++++-----
1 file changed, 5 insertions(+), 5 deletions(-)

commit 66d324b83aec5f90028bc857f279afd28c61e664
Author: Jonathan Zacsh jzacsh@gmail.com
Date: Wed Apr 27 20:28:07 2016 -0400

GH-#87: punt `with` declarations deps for later

src/tests/test-range.eq | 52 -----
src/tests/test-range.skip.eq | 52 ++++++
2 files changed, 52 insertions(+), 52 deletions(-)

commit 3699e0c7a031c60361003cd530f50c18d76c6de7
Author: Jonathan Zacsh jzacsh@gmail.com
Date: Wed Apr 27 20:11:42 2016 -0400

GH-#86; skipping correctly analyzed eqs w/deps

These tests pass correctly through our semantic analysis, but fail to generate proper C. GH-#86 is all about updating our codegen pass to correctly make use of the new sast as of GH-#56.

Below is the listing of SAST output of these 3 tests being skipped fo codegen purposes:

```
...
$ ./eqeq.native -s < tests/test-find-decl-assignment.skip.eq | sed -e '/^\s*$/d'
Foo : {
  deps:
  indeps:
    a : ...
    ... 40.;
  finds:
    "find_Foo_0": {
      [0]: {
        deps:
        indeps:
          a : ...
          ... 40.;
        }
      [2]: {
        deps:
        indeps:
          a : ...
          ... 40.;
          b : ...
          ... 2.;
        }
    }
  }
}

$ ./eqeq.native -s < tests/test-lazyresolved-vars-increment-self.skip.eq | sed -e '/^\s*$/d'
Foo : {
  deps:
    b: [c]
  indeps:
```



```

a : ...
  1.;
...
finds:
  "find_Foo_0": {
    [0]: {
      deps:
        b: [c]
      indeps:
        a : ...
          1.;
          ...
    }
    [7]: {
      deps:
        b: [c]
      indeps:
        a : ...
          a + 1.;
          ...
    }
    [12]: {
      deps:
        b: [c]
      indeps:
        a : ...
          a + 1.;
          ...
        d : ...
          0.;
          ...
    }
    [23]: {
      deps:
        a: [d]
        b: [c]
      indeps:
        d : ...
          d + 1.;
          ...
    }
    [25]: {
      deps:
        a: [d]
        b: [c]
      indeps:
        c : ...
          3.;
          ...
        d : ...
          d + 1.;
          ...
    }
    [32]: {
      deps:
        a: [d]
      indeps:
        b : ...
          b + 1.;
          ...
        c : ...
          3.;
          ...
        d : ...
          d + 1.;
          ...
    }
    [39]: {
      deps:
        a: [d]
      indeps:
        b : ...
          b + 3.;
          ...
        c : ...
          3.;
          ...
        d : ...
          d + 1.;
          ...
    }
  }
}
}

```

```

$ ./equeq.native -s < tests/test-lazyresolved-vars.skip.eq | sed -e '/^\s*$/d'
SomeCtx : {
  deps:
    a: [b]
    b: [c]
  indeps:
    c : ``
    .. 5.;
    ..
    f : ``
    .. 1. / 3.;
    ..
  finds:
    "find_SomeCtx_0": {
      [0]: {
        deps:
          a: [b]
          b: [c]
        indeps:
          c : ``
          .. 5.;
          ..
          f : ``
          .. 1. / 3.;
          ..
      }
      [2]: {
        deps:
          a: [b]
          b: [c]
        indeps:
          c : ``
          .. 5.;
          ..
          d : ``
          .. 100.;
          ..
          f : ``
          .. 1. / 3.;
          ..
      }
      [8]: {
        deps:
          a: [b]
        indeps:
          b : ``
          .. 2.;
          ..
          c : ``
          .. 5.;
          ..
          d : ``
          .. 100.;
          ..
          f : ``
          .. 1. / 3.;
          ..
      }
    }
  }
}
...

```

```

src/tests/test-find-decl-assignment.eq | 8 -----
src/tests/test-find-decl-assignment.skip.eq | 8 ++++++++
src/tests/test-lazyresolved-vars-increment-self.eq | 23 -----
.../test-lazyresolved-vars-increment-self.skip.eq | 23 ++++++++
src/tests/test-lazyresolved-vars.eq | 15 -----
src/tests/test-lazyresolved-vars.skip.eq | 15 ++++++++
6 files changed, 46 insertions(+), 46 deletions(-)

```

commit fb9e3b16fb50d7cce5e9804ba243e764e5f54a8
Author: Jonathan Zacsh jzacsh@gmail.com
Date: Wed Apr 27 19:56:43 2016 -0400

nit: report grade out of 100% of passing tests

src/bin/e2e-tests.sh | 5 ++++-
1 file changed, 4 insertions(+), 1 deletion(-)

commit 564ac80785716d23e1c4dd45f43bf624256014f8
Author: Tianci Zhong tz2278@columbia.edu
Date: Wed Apr 27 19:48:26 2016 -0400

collapse global context to one

src/scanner.mll | 2 +-
src/semant.ml | 18 ++++++++-----
2 files changed, 16 insertions(+), 4 deletions(-)

commit 7313bcdd61f26c8ba5dbc1bb9b9b92e5914c456a
Author: Jonathan Zacsh jzacsh@gmail.com
Date: Wed Apr 27 19:32:53 2016 -0400

noop/nit: remove extra empty lines

src/tests/test-range.eq | 5 -----
1 file changed, 5 deletions(-)

commit a24bf868888fe5730f438aac3a9a32ecc6fd8bbd
Author: Jonathan Zacsh jzacsh@gmail.com
Date: Wed Apr 27 19:31:22 2016 -0400

noop(readability): indent test code

src/tests/fail-if-find-assign-predicate.eq | 5 +++--
1 file changed, 2 insertions(+), 3 deletions(-)

commit 7d43da9d516fbf484b2034b568767dc2130247cf
Author: Jonathan Zacsh jzacsh@gmail.com
Date: Wed Apr 27 19:30:33 2016 -0400

fix test's new false-positive due to unresolved eq

src/tests/fail-if-find-assign-predicate.eq | 1 +
1 file changed, 1 insertion(+)

commit aed419722f52ef5c7c9302c63a8702da715e236d
Author: Jonathan Zacsh jzacsh@gmail.com
Date: Wed Apr 27 19:25:54 2016 -0400

undoes bad manual merge; rm's `quot` per upstream

misread upstream's 49a43637abcbf20e and did the inverse of it's work when i manually merged semant.ml

src/semant.ml | 6 +++--
1 file changed, 3 insertions(+), 3 deletions(-)

commit 82fdfa5fc9e88e2df3f69242bebadfdc07f57ae4
Author: Jonathan Zacsh jzacsh@gmail.com
Date: Wed Apr 27 18:33:08 2016 -0400

fix unmatched Statements merged from master

src/relation.ml | 2 ++
1 file changed, 2 insertions(+)

commit 8f525b37b318b634ccc56a56d5d323ff2f9579b7
Author: Jonathan Zacsh jzacsh@gmail.com
Date: Wed Apr 27 18:32:07 2016 -0400

noop(readability) DRYs up d064591f15 (stmt lists)

src/relation.ml | 20 ++++++-----
1 file changed, 7 insertions(+), 13 deletions(-)

commit d064591f15985700ab2a6e083a528fe37987c2c2
Author: Jonathan Zacsh jzacsh@gmail.com
Date: Wed Apr 27 18:24:39 2016 -0400

fixes broken blind merge in f19d4436ed

merge was noop for my own code (just merge w/o testing); now my own branch's changes compile again. untested against newly merged tests, though.

src/relation.ml | 36 ++++++-----
src/semant.ml | 1 +
2 files changed, 23 insertions(+), 14 deletions(-)

commit 98dc18cbdc6eca94e77f35087b183cc7f70a3bec
Author: Jonathan Zacsh jzacsh@gmail.com
Date: Wed Apr 27 17:00:11 2016 -0400

completed equations dependencies

tl;dr was accidentally doing BFS rather than DFS. Relevant comment in the code.

interesting aside: what *looks* cyclical is actually sometimes just use of unresolved variables.

src/relation.ml | 126 ++++++-----
src/tests/fail-lazyresolved-cyclical.err | 2 +-
src/tests/fail-lazyresolved-vars-new-cycle.err | 2 +-
src/tests/fail-undefined-variable.eq | 3 +-
src/tests/fail-undefined-variable.err | 2 +-
src/tests/fail-var-defined-in-diff-ctx.err | 2 +-
6 files changed, 47 insertions(+), 90 deletions(-)

commit c6077fb7da9e703e875bcfad09402f4a73c89dd3
Author: Jonathan Zacsh jzacsh@gmail.com
Date: Wed Apr 27 04:30:14 2016 -0400

partial solution to self-increment: recursion

- found (and added test) that potential is even more complicated
- addressed complication by walking all the way back a variable's history

src/relation.ml | 33 ++++++-----
src/tests/test-lazyresolved-vars-increment-self.eq | 17 ++++++-----
.../test-lazyresolved-vars-increment-self.out | 4 +-
3 files changed, 34 insertions(+), 20 deletions(-)

commit 66c7c3df8752a46898ecb68e025119a68c36c6eb
Author: Jonathan Zacsh jzacsh@gmail.com
Date: Wed Apr 27 03:04:10 2016 -0400

```
90% equation dependency walk; 10%: `a += 1`  
  
that is: `a = a + 1` programming-esque logic currently not accounted for;  
- adds lengthy note left in code and added  
- 2b2b4c806ee added test for precisely this problem
```

src/relation.ml | 69 ++++++-----
1 file changed, 55 insertions(+), 14 deletions(-)

commit a18bb43f0de750c4fa67a36ebd9794a9cfaf6968
Author: Jonathan Zacsh jzacsh@gmail.com
Date: Wed Apr 27 03:01:05 2016 -0400

```
noop(refactor) pulls out equation-dependency walk  
  
Pulls out as larger API as it will grow significantly in next commit
```

src/relation.ml | 42 +++++-----
1 file changed, 22 insertions(+), 20 deletions(-)

commit d263b2ef737d3ecc4817302c7e0445fb76055792
Author: Jonathan Zacsh jzacsh@gmail.com
Date: Wed Apr 27 02:51:57 2016 -0400

```
adds tests for cyclical dependencies  
  
error messages may not stay the same, but roughly we want to ensure these cases  
at least fail. specifically, want to ensure this is a different failure than the  
vanilla `fail-lazyresolved-vars.eq` case.
```

src/tests/fail-lazyresolved-cyclical.eq | 12 ++++++
src/tests/fail-lazyresolved-cyclical.err | 1 +
src/tests/fail-lazyresolved-vars-new-cycle.eq | 14 ++++++
src/tests/fail-lazyresolved-vars-new-cycle.err | 1 +
4 files changed, 28 insertions(+)

commit 09a1a55a90b3a03547aeb0346e1437c8dce7ee65
Author: Jonathan Zacsh jzacsh@gmail.com
Date: Wed Apr 27 02:49:11 2016 -0400

```
unresolved eq test: simplify to clarify what fails  
  
- ensures `find` target is bullet proof (ie: ensures some other codegen/semant  
  logic can't give me false positives)  
- remove extra unresolved `b` reference, to further simplify the error handling  
  being tested against
```

src/tests/fail-lazyresolved-vars.eq | 5 +++--
src/tests/fail-lazyresolved-vars.err | 3 +--
2 files changed, 4 insertions(+), 4 deletions(-)

commit 2b2b4c806ee01407c64a76b744202e1bc553476d
Author: Jonathan Zacsh jzacsh@gmail.com
Date: Wed Apr 27 02:46:53 2016 -0400

```
tests for self-increment variables, eg: a = a + 1
```

also simplifies `while` test to distinguish from failure case added by said new,
"test-lazyresolved-vars-increment-self" test

src/tests/test-lazyresolved-vars-increment-self.eq | 16 ++++++
src/tests/test-lazyresolved-vars-increment-self.out | 6 ++++++
src/tests/test-while.eq | 13 ++++++-----
src/tests/test-while.out | 1 -
4 files changed, 29 insertions(+), 7 deletions(-)

commit a321f7ef608cd56d91ba2d9e3c7be8b89ef21a29
Author: Jonathan Zacsh jzacsh@gmail.com
Date: Wed Apr 27 02:45:58 2016 -0400

nit: shrink doc about error case

src/tests/test-lazyresolved-vars.eq | 3 +-
1 file changed, 2 insertions(+), 1 deletion(-)

commit 642e2bc14ad60d2528514192d5a5cdf75fd54bf1
Author: Jonathan Zacsh jzacsh@gmail.com
Date: Wed Apr 27 01:56:54 2016 -0400

noop(readability) no indentation in test code

src/tests/test-while.eq | 6 +++--
1 file changed, 3 insertions(+), 3 deletions(-)

commit d1ad5dd4f6fbb2d3476ecd1b81c6b8f5354bbd96
Author: Jonathan Zacsh jzacsh@gmail.com
Date: Tue Apr 26 21:26:42 2016 -0400

nit: separate line for compiler errors and our wrapper test suite errors

src/bin/e2e-tests.sh | 2 +-
1 file changed, 1 insertion(+), 1 deletion(-)

commit bb5e0491293270b9789a5cc27f2669673bd63255
Author: Jonathan Zacsh jzacsh@gmail.com
Date: Tue Apr 26 20:39:06 2016 -0400

noop(tests) add coverage for order of ops on operator conversion to C function

src/tests/test-pow-order-of-ops.eq | 8 ++++++
src/tests/test-pow-order-of-ops.out | 1 +
2 files changed, 9 insertions(+)

commit 9a6ce38432af298a31d17089a494e65f4af48b14
Author: Jonathan Zacsh jzacsh@gmail.com
Date: Tue Apr 26 20:30:16 2016 -0400

noop(readability) do not overwrite "latest" which is already a variable

src/relation.ml | 16 ++++++-----
1 file changed, 8 insertions(+), 8 deletions(-)

commit a905e6791262a7c47a97434132f639c0f3c8edef
Author: Jonathan Zacsh jzacsh@gmail.com
Date: Tue Apr 26 20:22:20 2016 -0400

bug fix: *actually* rewrite equations in SAST

uses refactor in fed505b to determine where said rewritten equation should move to. eg, note how `b` is promoted to "independent" equation in expression 7, caused by `b`'s redeclaration as of c43a0d2782:

```
...
$ make >/dev/null && ./eqeq.native -s < ./tests/test-lazyresolved-vars.eq
SomeCtx : {
  deps:
    a: [b]
    b: [c]

  indeps:
    c : ``
      5.;

    ``
    f : ``
      1. / 3.;

    ``

  finds:
    "find_SomeCtx_0": {
      [0]: {
        deps:
          a: [b]
          b: [c]

        indeps:
          c : ``
            5.;

          ``
          f : ``
            1. / 3.;

          ``
        }
      [7]: {
        deps:
          a: [b]

        indeps:
          b : ``
            2.;

          ``
          c : ``
            5.;

          ``
          f : ``
            1. / 3.;

          ``
        }
      }
    }
  }
}
```

src/relation.ml | 17 ++++++++-----
1 file changed, 13 insertions(+), 4 deletions(-)

commit fed505b4c5546886d74efb0bae7e300e9e688741
Author: Jonathan Zacsh jzacsh@gmail.com
Date: Tue Apr 26 20:21:50 2016 -0400

noop(refactor) cleans up and shares API to list a statement's dependencies; needed in pending bug fix

src/relation.ml | 17 ++++++-----

1 file changed, 9 insertions(+), 8 deletions(-)

commit ea2b25f5f94b4016a8d33988f80d9420eb3819c5

Author: Jonathan Zacsh jzacsh@gmail.com

Date: Tue Apr 26 20:00:04 2016 -0400

bug(noop) identify spot where scope fork never really happens (but is intended)

src/relation.ml | 9 +++++----

1 file changed, 5 insertions(+), 4 deletions(-)

commit 1a324b72e0d8cee99af8537d9cace6a59013acb8

Author: Jonathan Zacsh jzacsh@gmail.com

Date: Tue Apr 26 19:59:10 2016 -0400

fix bug: ocaml warning found i was never actually executing this check

src/relation.ml | 2 +-

1 file changed, 1 insertion(+), 1 deletion(-)

commit 21e08ed9b1e8c266755cd91f5d178e9ac8ac9867

Author: Jonathan Zacsh jzacsh@gmail.com

Date: Tue Apr 26 19:58:44 2016 -0400

fix typo in existing doc at crucial find-scope foring point

src/relation.ml | 12 +++++-----

1 file changed, 5 insertions(+), 7 deletions(-)

commit 261af42dd2e68cb838097b9d420ac79d7e4d5902

Author: Jonathan Zacsh jzacsh@gmail.com

Date: Tue Apr 26 19:57:54 2016 -0400

fix incorrect doc (changed since code forked into a module file)

src/relation.ml | 4 +---

1 file changed, 1 insertion(+), 3 deletions(-)

commit cbf1c36fdac1e65c3494c28068633894653a2e56

Author: Jonathan Zacsh jzacsh@gmail.com

Date: Tue Apr 26 19:39:39 2016 -0400

noop(readability) fix confusing name, and better document API

src/relation.ml | 8 +++++----

1 file changed, 4 insertions(+), 4 deletions(-)

commit c8e75e7e65d0b5b05315b8ce91462c68649c5ebf

Author: Jonathan Zacsh jzacsh@gmail.com

Date: Tue Apr 26 19:36:52 2016 -0400

fixes rendering of more complex case from c43a0d2782

src/sast.ml | 25 ++++++-----
1 file changed, 15 insertions(+), 10 deletions(-)

commit c43a0d2782f1c61f53b99cadba8f0a29783b5aab
Author: Jonathan Zacsh jzacsh@gmail.com
Date: Tue Apr 26 19:36:17 2016 -0400

fixes test output & demonstrates scope overwriting

src/tests/test-lazyresolved-vars.eq | 6 +++++-
src/tests/test-lazyresolved-vars.out | 1 +
2 files changed, 6 insertions(+), 1 deletion(-)

commit 427260965b538a19051a43e441b3875eafe9e883
Author: Jonathan Zacsh jzacsh@gmail.com
Date: Tue Apr 26 19:07:33 2016 -0400

noop(debugging) use dynamic indenting w/sast dump

Now everything is finally readable, no matter how complicated; eg:

```
...  
$ make >/dev/null && ./eqeq.native -s < ./tests/test-lazyresolved-vars.eq  
SomeCtx : {  
  deps:  
    a: [b]  
    b: [c]  
  
  indeps:  
    c : ...  
    ... 5.;  
  
  finds:  
    "find_SomeCtx_0": {  
      [0]: {  
        a: [b]  
        b: [c]  
  
        c : ...  
        ... 5.;  
  
      }  
    }  
  }  
}
```

src/eqeq.ml | 2 +-
src/sast.ml | 126 ++++++-----
2 files changed, 93 insertions(+), 35 deletions(-)

commit 1b8910806da1ec39b1ed506de023c2dd4a18653d
Author: Jonathan Zacsh jzacsh@gmail.com
Date: Tue Apr 26 01:17:11 2016 -0400

noop(readability) more code collapse

src/relation.ml | 3 +--
src/semant.ml | 3 +--
2 files changed, 2 insertions(+), 4 deletions(-)

commit d23c7ddbafb22ae2f9d148d8a0c65f07096f8f9
Author: Jonathan Zacsh jzacsh@gmail.com
Date: Tue Apr 26 01:07:54 2016 -0400

noop: renames to shrink codez

src/relation.ml | 55 ++++++-----
1 file changed, 26 insertions(+), 29 deletions(-)

commit 1796b7deec8c4b22906335fc5a61165f67ea0acb
Author: Jonathan Zacsh jzacsh@gmail.com
Date: Tue Apr 26 00:42:38 2016 -0400

nit: hide `latest` var where it is actually used

src/relation.ml | 10 ++++-----
1 file changed, 4 insertions(+), 6 deletions(-)

commit 40dfd594deb0038a33cfe772c306285d19748bfa
Author: Jonathan Zacsh jzacsh@gmail.com
Date: Mon Apr 25 22:29:59 2016 -0400

expose `oldest` API promised for use in codegen
(and fix documentation to match other `List.fold_left` handler)

src/relation.ml | 35 ++++++-----
1 file changed, 17 insertions(+), 18 deletions(-)

commit 719a8af4b340191a16e8a13a7c67ef9a45a345b6
Author: Jonathan Zacsh jzacsh@gmail.com
Date: Mon Apr 25 22:25:55 2016 -0400

noop: document relation API provided to semant.ml
(and collapse some style that disagrees with ocp-indent)

src/relation.ml | 1 +
src/semant.ml | 7 ++-----
2 files changed, 3 insertions(+), 5 deletions(-)

commit 814e6e8fc91b01c465c96e564881fa4b01069619
Author: Tianci Zhong tz2278@columbia.edu
Date: Mon Apr 25 21:53:10 2016 -0400

modified parser to accept global declaration

src/parser.mly | 25 ++++++-----
1 file changed, 18 insertions(+), 7 deletions(-)

commit 9d82be1a00cac43abac69f611d80eb6403e12fae
Author: Tianci Zhong tz2278@columbia.edu
Date: Mon Apr 25 21:51:25 2016 -0400

add test for global context

src/tests/test-global.eq | 16 ++++++-----
src/tests/test-global.out | 3 +++
2 files changed, 19 insertions(+)

commit 69cbb84162f6d2ff8d7672a841ed9dab820c6417
Author: Jonathan Zacsh jzacsh@gmail.com
Date: Mon Apr 25 21:04:12 2016 -0400

noop: move fold_left funnctions to `relation.ml`

Hopefully addresses complaint that code is too large. Is definitely clearer how the new part of the sast is being onstructed, now.

src/Makefile | 6 +-
src/relation.ml | 147 ++++++
src/semant.ml | 183 +++++-----
3 files changed, 167 insertions(+), 169 deletions(-)

commit 49a43637abcbf20e53b48b19cf3c3245a88e675d
Author: Ruicong Xie rx2119@columbia.edu
Date: Mon Apr 25 17:50:12 2016 -0400

fixed all the warming messages

src/eqeq.ml | 2 +-
src/semant.ml | 63 ++++++-----
2 files changed, 33 insertions(+), 32 deletions(-)

commit 60279fd937897f832e844c65660651bda966f90b
Author: Jonathan Zacsh jzacsh@gmail.com
Date: Mon Apr 25 14:22:57 2016 -0400

show super-basic find-decl assigment is broken, unrelated to this pull-request

src/tests/test-find-decl-assignment.eq | 8 ++++++
src/tests/test-find-decl-assignment.out | 1 +
2 files changed, 9 insertions(+)

commit 327ada3bc3ae36d6a81c8061e0bd1c575248a35f
Author: Jonathan Zacsh jzacsh@gmail.com
Date: Mon Apr 25 14:15:46 2016 -0400

implements re-assignment of IDs and adds new test

- new test ensures we're not doing anything stupid - ie: we should be doing a tree walk down the assignments, looking.
- new compiler - as of this comment - behavior unchecked; just committing for posterity. currently produces broken C (may or may not be part of this pull request).

src/semant.ml | 70 ++++++-----
.../test-lazyresolved-vars-nested-assignment.out | 1 +
...est-lazyresolved-vars-nested-assignment.skip.eq | 9 +++
3 files changed, 55 insertions(+), 25 deletions(-)

commit 592aca90ab9c8d762c61a438e531b15ba5c7975f
Author: Jonathan Zacsh jzacsh@gmail.com
Date: Mon Apr 25 14:08:59 2016 -0400

doc: show that find blocks are actually lists of statements

notes/whiteboard-eq-analysis.md | 35 ++++++-----

1 file changed, 19 insertions(+), 16 deletions(-)

commit 75b4fb591e5c302daaae4bd7f3138719de2edc28
Author: Jonathan Zacsh jzacsh@gmail.com
Date: Mon Apr 25 14:08:02 2016 -0400

fix typo in doc: we intended for multiplication to be shown here

notes/whiteboard-eq-analysis.md | 2 +-
1 file changed, 1 insertion(+), 1 deletion(-)

commit 1a76cab09a5c1bfe9cbdd24cffe85d3e7ea50c62
Author: Ruicong Xie rx2119@columbia.edu
Date: Sun Apr 24 20:29:40 2016 -0400

modified tests

src/tests/fail-if-ctx-assign-predicate.eq | 2 ++
src/tests/fail-if-ctx-assign-predicate.err | 2 +-
src/tests/fail-if-ctx-empty-predicate.eq | 1 +
src/tests/fail-if-ctx-print-predicate.eq | 2 ++
src/tests/fail-if-ctx-print-predicate.err | 2 +-
src/tests/fail-if-ctx-string-predicate.eq | 2 ++
src/tests/fail-if-ctx-string-predicate.err | 2 +-
src/tests/fail-if-find-assign-predicate.err | 2 +-
src/tests/fail-if-find-print-predicate.err | 2 +-
src/tests/fail-if-find-string-predicate.err | 2 +-
10 files changed, 13 insertions(+), 6 deletions(-)

commit 947ee136fc78ac3a43494c885d5fd3a9bf67b41d
Author: Ruicong Xie rx2119@columbia.edu
Date: Sun Apr 24 20:29:05 2016 -0400

fix semant checking order for if/ return and fail tests after resolving merge conflict

src/semant.ml | 8 ++++----
1 file changed, 4 insertions(+), 4 deletions(-)

commit 7c28bd01eb6562894e50af7b25ba81e6e0ea46b0
Author: Ruicong Xie rx2119@columbia.edu
Date: Sun Apr 24 19:51:45 2016 -0400

unskipped return test

src/tests/fail-multieq-without-return.eq | 7 +++++++
src/tests/fail-multieq-without-return.err | 1 +
src/tests/fail-multieq-without-return.skip.eq | 7 -----
3 files changed, 8 insertions(+), 7 deletions(-)

commit 147316bff5ff64dc35e391df34d68a9bfa82635f
Author: Ruicong Xie rx2119@columbia.edu
Date: Sat Apr 23 01:48:32 2016 -0400

weren't checking stmts in ctx properly moved funcs ahead and added checks

src/semant.ml | 47 ++++++-----

1 file changed, 29 insertions(+), 18 deletions(-)

commit 82359f27c4229ead807977e81190e4baefd085b0
Author: Ruicong Xie rx2119@columbia.edu
Date: Sat Apr 23 01:45:51 2016 -0400

tests for return string

src/tests/fail-return-in-ctx-nested-string.eq | 13 ++++++++
src/tests/fail-return-in-ctx-nested-string.err | 1 +
src/tests/fail-return-in-ctx-string.eq | 7 ++++++
src/tests/fail-return-in-ctx-string.err | 1 +
4 files changed, 22 insertions(+)

commit 529d6769c7d97d460ebdc29354497e31a91a9fd0
Author: Ruicong Xie rx2119@columbia.edu
Date: Sat Apr 23 00:48:32 2016 -0400

updated return error msg and semant for return check with no else clause

src/semant.ml | 8 +++++--
src/tests/fail-no-return-in-else-ctx.err | 2 +-
src/tests/fail-return-in-cxt-nested.err | 2 +-
src/tests/fail-return-in-cxt-no-else.err | 2 +-
4 files changed, 9 insertions(+), 5 deletions(-)

commit 9f16e6b1fbca98dfc7800144e689b1c51c9ddaf4
Author: Ruicong Xie rx2119@columbia.edu
Date: Sat Apr 23 00:35:49 2016 -0400

more tests

src/tests/fail-return-in-cxt-no-else.eq | 16 ++++++++
src/tests/fail-return-in-cxt-no-else.err | 1 +
src/tests/test-return-in-cxt-if.eq | 6 +++--
src/tests/test-return-in-cxt-if.out | 2 +-
4 files changed, 21 insertions(+), 4 deletions(-)

commit 780b71c981c77d8143ca233618959804d00cad9f
Author: Ruicong Xie rx2119@columbia.edu
Date: Sat Apr 23 00:15:30 2016 -0400

fixed a bug where if in ctx didn't check math lib

src/semant.ml | 8 +++++--
1 file changed, 5 insertions(+), 3 deletions(-)

commit 58f5c926181045638eea402072126eb0025ec82f
Author: Ruicong Xie rx2119@columbia.edu
Date: Sat Apr 23 00:14:41 2016 -0400

more tests for return

src/tests/fail-return-in-cxt-nested.eq | 19 ++++++++
src/tests/fail-return-in-cxt-nested.err | 1 +
src/tests/test-return-in-cxt-if.eq | 14 ++++++++

src/tests/test-return-in-cxt-if.out | 1 +
src/tests/test-return-in-cxt-nested.eq | 20 +++++
src/tests/test-return-in-cxt-nested.out | 1 +
6 files changed, 56 insertions(+)

commit 06b8076ab7f0a9045e4c8cb956e015864dca326f
Author: Ruicong Xie rx2119@columbia.edu
Date: Fri Apr 22 22:39:25 2016 -0400

semant for return

src/semant.ml | 54 +++++-----
1 file changed, 41 insertions(+), 13 deletions(-)

commit 5389e076c2e5b6aefbf1c072aac11aeb9ce50b0c
Author: Ruicong Xie rx2119@columbia.edu
Date: Fri Apr 22 22:39:10 2016 -0400

tests for return semant

src/tests/fail-no-return-in-else-ctx.eq | 14 +++++
src/tests/fail-no-return-in-else-ctx.err | 1 +
src/tests/test-return-cxt.eq | 10 +++++
src/tests/test-return-cxt.out | 1 +
4 files changed, 26 insertions(+)

commit 63b130aa0b15f523bab8417b885283d3bfb0f1a1
Author: Tianci Zhong tz2278@columbia.edu
Date: Fri Apr 22 21:33:26 2016 -0400

update scanner and add test

src/scanner.mll | 5 +++++
src/tests/fail-illegal-namespace-int.err | 1 +
src/tests/fail-illegal-namespace-struct.eq | 6 +++++
src/tests/fail-illegal-namespace-struct.err | 1 +
src/tests/fail-illegal-namespace-void.eq | 7 +++++
src/tests/fail-illegal-namespace-void.err | 1 +
6 files changed, 21 insertions(+)

commit ba135d50e0120424d7326e7330ce7f8c956d5b8f
Author: Tianci Zhong tz2278@columbia.edu
Date: Fri Apr 22 21:03:37 2016 -0400

add fail test for illegal namespace in c

src/tests/fail-illegal-namespace-int.eq | 7 +++++
src/tests/fail-illegal-namespace-int.err | 0
2 files changed, 7 insertions(+)

commit 0921831e62d50eba181073708c179eaac804702
Author: Ruicong Xie rx2119@columbia.edu
Date: Fri Apr 22 17:17:27 2016 -0400

fixed semant for while condtion, added semant for illegal return in find

src/semant.ml | 22 ++++++-----
1 file changed, 14 insertions(+), 8 deletions(-)

commit 93190351593e18ff4609e05554ea4b8ea3a18176
Author: Ruicong Xie rx2119@columbia.edu
Date: Fri Apr 22 17:15:08 2016 -0400

illegal return fail test

src/tests/fail-return-in-find-while.eq | 11 ++++++
src/tests/fail-return-in-find-while.err | 1 +
src/tests/fail-return-in-find.eq | 2 +-
src/tests/fail-return-in-find.err | 2 +-
4 files changed, 14 insertions(+), 2 deletions(-)

commit 4d542d5bb252c3fe91a2411fdeafcaf6bdfbe213
Author: Ruicong Xie rx2119@columbia.edu
Date: Fri Apr 22 15:43:04 2016 -0400

added semant for ctx block if else if

src/semant.ml | 33 ++++++-----
1 file changed, 17 insertions(+), 16 deletions(-)

commit dfd266eaa647910eb4eda0f82679b2229dc10f39
Author: Ruicong Xie rx2119@columbia.edu
Date: Fri Apr 22 15:42:33 2016 -0400

additional test for ctx block, renamed tests for find block

src/tests/fail-if-assign-predicate.eq | 12 -----
src/tests/fail-if-assign-predicate.err | 1 -
src/tests/fail-if-ctx-assign-predicate.eq | 13 ++++++
src/tests/fail-if-ctx-assign-predicate.err | 1 +
src/tests/fail-if-ctx-else-else-if.eq | 17 ++++++
src/tests/fail-if-ctx-else-else-if.err | 1 +
src/tests/fail-if-ctx-empty-predicate.eq | 9 ++++++
src/tests/fail-if-ctx-empty-predicate.err | 1 +
src/tests/fail-if-ctx-print-predicate.eq | 13 ++++++
src/tests/fail-if-ctx-print-predicate.err | 1 +
src/tests/fail-if-ctx-string-predicate.eq | 13 ++++++
src/tests/fail-if-ctx-string-predicate.err | 1 +
src/tests/fail-if-else-else-if.eq | 17 -----
src/tests/fail-if-else-else-if.err | 1 -
src/tests/fail-if-empty-predicate.eq | 8 -----
src/tests/fail-if-empty-predicate.err | 1 -
src/tests/fail-if-find-assign-predicate.eq | 12 ++++++
src/tests/fail-if-find-assign-predicate.err | 1 +
src/tests/fail-if-find-else-else-if.eq | 16 ++++++
src/tests/fail-if-find-else-else-if.err | 1 +
src/tests/fail-if-find-empty-predicate.eq | 8 ++++++
src/tests/fail-if-find-empty-predicate.err | 1 +
src/tests/fail-if-find-print-predicate.eq | 12 ++++++
src/tests/fail-if-find-print-predicate.err | 1 +
src/tests/fail-if-find-string-predicate.eq | 13 ++++++
src/tests/fail-if-find-string-predicate.err | 1 +
src/tests/fail-if-print-predicate.eq | 12 -----
src/tests/fail-if-print-predicate.err | 1 -
src/tests/fail-if-string-predicate.eq | 13 -----

src/tests/fail-if-string-predicate.err | 1 -
30 files changed, 136 insertions(+), 67 deletions(-)

commit 20f1a9381124784b91cca4406bf996e4a42cdaef
Author: Ruicong Xie rx2119@columbia.edu
Date: Thu Apr 21 00:40:45 2016 -0400

fail test for return

src/tests/fail-return-in-find.eq | 8 ++++++++
src/tests/fail-return-in-find.err | 1 +
2 files changed, 9 insertions(+)

commit df7c0a2fdcc3ef9954b0bd88b02528f45465baec
Author: Ruicong Xie rx2119@columbia.edu
Date: Thu Apr 21 00:25:41 2016 -0400

if semant for assign print string

src/semant.ml | 25 ++++++++-----
src/tests/fail-if-assign-predicate.eq | 12 ++++++++
src/tests/fail-if-assign-predicate.err | 1 +
src/tests/fail-if-print-predicate.eq | 12 ++++++++
src/tests/fail-if-print-predicate.err | 1 +
src/tests/fail-if-string-predicate.eq | 13 ++++++++
src/tests/fail-if-string-predicate.err | 1 +
7 files changed, 59 insertions(+), 6 deletions(-)

commit 8571fa06e6a4023b9ca69e36845ba5d652e1fbec
Author: Jonathan Zacsh jzacsh@gmail.com
Date: Wed Apr 20 15:59:55 2016 -0400

simplify pseudocode i think caused some confusion

notes/whiteboard-eq-analysis.md | 4 +--
1 file changed, 1 insertion(+), 3 deletions(-)

commit 3ac84e6f2199a7a6e00d0974fc6262bad9b9df36
Author: Ruicong Xie rx2119@columbia.edu
Date: Wed Apr 20 14:31:29 2016 -0400

error message indent

src/tests/fail-if-else-else-if.err | 2 +-
1 file changed, 1 insertion(+), 1 deletion(-)

commit f96df16ba7986ae4399cf73d60ddd3d707c7819b
Author: Ruicong Xie rx2119@columbia.edu
Date: Wed Apr 20 14:24:49 2016 -0400

indented and added comment

src/tests/fail-if-else-else-if.eq | 16 ++++++++-----
1 file changed, 9 insertions(+), 7 deletions(-)

commit 74b47949d39d58cdef938ec895c057659fa733d

Author: Ruicong Xie rx2119@columbia.edu

Date: Wed Apr 20 13:32:28 2016 -0400

added fail test

src/tests/fail-if-else-else-if.eq | 15 ++++++
src/tests/fail-if-else-else-if.err | 1 +
2 files changed, 16 insertions(+)

commit d58408f98a2541d53c105d5cbaf948aa0bfd1efe

Author: Tianci Zhong tz2278@columbia.edu

Date: Mon Apr 18 14:59:15 2016 -0400

clean up the code

src/ast.ml | 3 ---
src/codegen.ml | 16 +++++-----
src/semant.ml | 16 -----
3 files changed, 5 insertions(+), 30 deletions(-)

commit c995f363841d5bbc756d7966874f792d50aef4ac

Author: Ruicong Xie rx2119@columbia.edu

Date: Mon Apr 18 14:50:05 2016 -0400

corrected ctx section of LRM

notes/language-reference-manual.md | 5 ++---
1 file changed, 2 insertions(+), 3 deletions(-)

commit a85a141296e394e9b94217fd2ed60f34f9e730a5

Author: Tianci Zhong tz2278@columbia.edu

Date: Sun Apr 17 22:58:41 2016 -0400

add test and edit codegen

src/codegen.ml | 3 +-
src/tests/fail-multieq-without-return.err | 0
src/tests/fail-multieq-without-return.skip.eq | 7 +++++
src/tests/test-multieq-print.eq | 9 ++++++
src/tests/test-multieq-print.out | 2 ++
src/tests/test-return-builtin.eq | 25 ++++++
src/tests/test-return-builtin.out | 5 +++
src/tests/test-return-expression.eq | 46 ++++++
src/tests/test-return-expression.out | 10 ++++++
src/tests/test-simple-equation.eq | 7 +++++
src/tests/test-simple-equation.skip.eq | 7 ----
11 files changed, 113 insertions(+), 8 deletions(-)

commit c9819df86b277e9b373cf82d90044ee1fa8fd1b1

Author: Ruicong Xie rx2119@columbia.edu

Date: Sun Apr 17 22:14:09 2016 -0400

unskipped simple equation test

src/tests/test-simple-equation.eq | 7 ++++++
src/tests/test-simple-equation.skip.eq | 7 -----

2 files changed, 7 insertions(+), 7 deletions(-)

commit 2092c8e8111aa2396b3916904aac49c5288498b8
Author: Tianci Zhong tz2278@columbia.edu
Date: Sun Apr 17 22:06:53 2016 -0400

update codegen for multieq

src/codegen.ml | 81 ++++++-----
src/tests/test-multi-equation.eq | 2 +
src/tests/test-multi-equation.out | 1 -
3 files changed, 70 insertions(+), 14 deletions(-)

commit 06de5dba77422388a7d8a03d920f4abdee33e544
Author: Ruicong Xie rx2119@columbia.edu
Date: Sun Apr 17 21:00:54 2016 -0400

added explanation for ctx block

notes/language-reference-manual.md | 29 ++++++
1 file changed, 29 insertions(+)

commit 984bc6ece990f7bca669433692bc699d94fc121b
Author: Tianci Zhong tz2278@columbia.edu
Date: Sun Apr 17 20:59:59 2016 -0400

add test for double brace

src/tests/fail-double-brace.eq | 6 ++++++
src/tests/fail-double-brace.err | 1 +
2 files changed, 7 insertions(+)

commit 2e40c125af152744f37775591d1726090cf60a9e
Author: Ruicong Xie rx2119@columbia.edu
Date: Sun Apr 17 20:09:55 2016 -0400

added syntax for single line equation in cxt

src/parser.mly | 2 ++
src/tests/test-single-line-eq-in-cxt.eq | 11 ++++++
src/tests/test-single-line-eq-in-cxt.out | 3 +++
3 files changed, 16 insertions(+)

commit 2eb6e2b66e3a52880e0d3346cab6ab041bf515fb
Author: Tianci Zhong tz2278@columbia.edu
Date: Sun Apr 17 18:18:32 2016 -0400

change parser stmt type

src/ast.ml | 22 ++++++-----
src/codegen.ml | 14 ++++++-----
src/parser.mly | 9 +++++-----
src/semant.ml | 38 ++++++-----
4 files changed, 40 insertions(+), 43 deletions(-)

commit a0ba695d1188309eb4619c19abdbe2264efebb63

Author: Nam Hoang nh2110@columbia.edu
Date: Sun Apr 17 15:43:05 2016 -0400

fix let/in display and indentation for consistency

src/semant.ml | 47 ++++++-----
1 file changed, 26 insertions(+), 21 deletions(-)

commit 0d84105dcd6a1a3e342ec2b93d50cc1d578e8b7b
Author: Ruicong Xie rx2119@columbia.edu
Date: Sun Apr 17 15:19:13 2016 -0400

fixed ocaml yacc parser warning

src/debugtokens.ml | 1 -
src/parser.mly | 5 +----
src/scanner.mll | 1 -
3 files changed, 1 insertion(+), 6 deletions(-)

commit 77eea2200b7570247584730c7aed18d48ff2b447
Author: kekeleila lh2756@barnard.edu
Date: Fri Apr 15 10:51:53 2016 -0400

change test file remove unnecessary syntax

src/tests/fail-break-in-as-variable.eq | 1 -
src/tests/fail-continue-in-as-variable.eq | 1 -
2 files changed, 2 deletions(-)

commit 4b495045f6c377521650c72b623482d2ef555d47
Author: kekeleila lh2756@barnard.edu
Date: Fri Apr 15 09:31:41 2016 -0400

add tests for break & continue in if condition and as variable

src/semant.ml | 2 +-
src/tests/fail-break-in-as-variable.eq | 8 ++++++
src/tests/fail-break-in-as-variable.err | 1 +
src/tests/fail-break-in-if-expr.eq | 8 ++++++
src/tests/fail-break-in-if-expr.err | 1 +
src/tests/fail-continue-in-as-variable.eq | 8 ++++++
src/tests/fail-continue-in-as-variable.err | 1 +
src/tests/fail-continue-in-if-expr.eq | 8 ++++++
src/tests/fail-continue-in-if-expr.err | 1 +
9 files changed, 37 insertions(+), 1 deletion(-)

commit f525f4aa5b125265919c4497046f9184fdd5c405
Author: kekeleila lh2756@barnard.edu
Date: Fri Apr 15 01:37:49 2016 -0400

update semant and test files for break & continue

src/semant.ml | 16 ++++++-----
src/tests/fail-break-before-continue.eq | 7 ++++++
src/tests/fail-break-before-continue.err | 1 +
src/tests/fail-break-context-continue | 0

```
src/tests/fail-break-context-continue.eq | 5 -----
src/tests/fail-break-context-continue.err | 1 -
src/tests/fail-break-context.eq | 6 -----
src/tests/fail-break-context.err | 1 -
src/tests/fail-break-else.eq | 26 -----
src/tests/fail-break-else.err | 1 -
src/tests/fail-break-if.eq | 9 -----
src/tests/fail-break-if.err | 1 -
src/tests/fail-break-in-context-decl.eq | 6 ++++++
src/tests/fail-break-in-context-decl.err | 1 +
src/tests/fail-break-in-else.eq | 12 ++++++
src/tests/fail-break-in-else.err | 1 +
src/tests/fail-break-in-finds_decl.eq | 6 ++++++
src/tests/fail-break-in-finds_decl.err | 1 +
src/tests/fail-break-in-if.eq | 9 ++++++
src/tests/fail-break-in-if.err | 1 +
src/tests/fail-break.eq | 7 -----
src/tests/fail-break.err | 1 -
src/tests/fail-continue-context.e | 0
src/tests/fail-continue-context.eq | 6 -----
src/tests/fail-continue-context.err | 1 -
src/tests/fail-continue-else.eq | 19 -----
src/tests/fail-continue-else.err | 1 -
src/tests/fail-continue-if.eq | 12 -----
src/tests/fail-continue-if.err | 1 -
src/tests/fail-continue-in-context_del.eq | 6 ++++++
src/tests/fail-continue-in-context_del.err | 1 +
src/tests/fail-continue-in-else.eq | 19 ++++++
src/tests/fail-continue-in-else.err | 1 +
src/tests/fail-continue-in-finds.eq | 6 ++++++
src/tests/fail-continue-in-finds.err | 1 +
src/tests/fail-continue-in-if.eq | 12 ++++++
src/tests/fail-continue-in-if.err | 1 +
src/tests/fail-continue.eq | 6 -----
src/tests/fail-continue.err | 1 -
src/tests/test-header-in-if.eq | 11 ++++++
src/tests/test-header-in-if.out | 2 ++
41 files changed, 113 insertions(+), 113 deletions(-)
```

commit e33cd75682c125bdef30c71b59a67a995f7d87fc
Author: kekeleila lh2756@barnard.edu
Date: Thu Apr 14 22:46:47 2016 -0400

```
add comment for semant.ml
```

```
src/semant.ml | 4 +++-
1 file changed, 3 insertions(+), 1 deletion(-)
```

commit 667a92eeefca58ffbc079a2962e8e9ad86fb188e
Author: kekeleila lh2756@barnard.edu
Date: Thu Apr 14 20:56:55 2016 -0400

```
save local files
```

```
src/ast.ml | 8 ++++----
src/codegen.ml | 4 +-+
src/parser.mly | 10 +++-----
src/semant.ml | 39 ++++++
src/tests/fail-break.eq | 9 ++++++
src/tests/fail-continue.eq | 9 ++++++
6 files changed, 61 insertions(+), 18 deletions(-)
```

commit 069a5aba0fa7092de206b7fa34665f312e648aa1
Author: Ruicong Xie rx2119@columbia.edu
Date: Thu Apr 14 13:13:36 2016 -0400

more actual fail function name

src/semant.ml | 4 ++--
1 file changed, 2 insertions(+), 2 deletions(-)

commit 2b4e33fd9791a5bc01ba968b2cab08fe66bdc15d
Author: Ruicong Xie rx2119@columbia.edu
Date: Thu Apr 14 13:08:19 2016 -0400

changed builtin functionnames

src/semant.ml | 8 ++++----
1 file changed, 4 insertions(+), 4 deletions(-)

commit 8b7132cf7a3257262ccaf52ef3dad752b1289717
Author: Ruicong Xie rx2119@columbia.edu
Date: Thu Apr 14 13:04:12 2016 -0400

better illegal arg msg for builtin

src/semant.ml | 2 +-
src/tests/fail-cos-illegal-arg-assign.err | 2 +-
src/tests/fail-log-illegal-arg-assign.err | 2 +-
src/tests/fail-sin-illegal-arg-assign.err | 2 +-
src/tests/fail-sqrt-illegal-arg-assign.err | 2 +-
src/tests/fail-tan-illegal-arg-assign.err | 2 +-
6 files changed, 6 insertions(+), 6 deletions(-)

commit 853a030755ea6cfc0fbd82c1c7a6b05dcf235c7c
Author: Jimmy Xie rxie25@gmail.com
Date: Thu Apr 14 02:55:08 2016 -0400

fixed typo in built-in LRM

notes/language-reference-manual.md | 7 ++-----
1 file changed, 2 insertions(+), 5 deletions(-)

commit 4417baeff861d466694e662de67dcd912f0efd07
Author: Ruicong Xie rx2119@columbia.edu
Date: Thu Apr 14 02:50:52 2016 -0400

updated built-in in LRM will add more examples to the section

notes/language-reference-manual.md | 26 ++++++-----
1 file changed, 25 insertions(+), 1 deletion(-)

commit 321df21a748049027756aff3c3f1aa5d4fb3b0a5
Author: Ruicong Xie rx2119@columbia.edu
Date: Thu Apr 14 02:25:31 2016 -0400

more readable nameadded check for print args

src/codegen.ml | 12 ++++-----
src/semant.ml | 18 ++++++++-----
src/tests/fail-builtin-in-print.eq | 7 ++++++++
src/tests/fail-builtin-in-print.err | 1 +
4 files changed, 21 insertions(+), 17 deletions(-)

commit a0f0cc39f3a8c52e58566794d750056386f594b4
Author: Jonathan Zacsh jzacsh@gmail.com
Date: Thu Apr 14 01:13:48 2016 -0400

major step (80%?) to implement sast var tree

Final `if`/`else` inside the `ASSIGN` match[1], is all that's left now

[1]: <https://github.com/rxie25/PLT2016Spring/blob/92f69e1b8990da/notes/whiteboard-eq-analysis.md#algorithm-in-pseudoc>

src/semant.ml | 101 ++++++++-----
1 file changed, 79 insertions(+), 22 deletions(-)

commit 57c7b417060653fcd467a679515fd96a1c7ed0ba
Author: Jonathan Zacsh jzacsh@gmail.com
Date: Thu Apr 14 01:11:23 2016 -0400

noop: unindent to clarify is public API

src/ast.ml | 20 ++++++++-----
1 file changed, 10 insertions(+), 10 deletions(-)

commit 812b0eccc19caaa3fdae5058727ff57ffac53170
Author: Ruicong Xie rx2119@columbia.edu
Date: Wed Apr 13 22:43:25 2016 -0400

missed a name

src/semant.ml | 6 +++---
1 file changed, 3 insertions(+), 3 deletions(-)

commit 0ce14ff1fe54c7886093af1b38e041ad71da31f6
Author: Tianci Zhong tz2278@columbia.edu
Date: Wed Apr 13 22:04:08 2016 -0400

fix mistake in lrm

notes/language-reference-manual.md | 3 +-
1 file changed, 2 insertions(+), 1 deletion(-)

commit 172938860432e22c8942ca36347acc647f3e13c4
Author: Tianci Zhong tz2278@columbia.edu
Date: Wed Apr 13 22:02:55 2016 -0400

add test for 'in' 'range' 'with'

src/tests/fail-in-without-range.eq | 8 ++++++++
src/tests/fail-in-without-range.err | 1 +
src/tests/fail-range-missing-semi.eq | 9 ++++++++
src/tests/fail-range-missing-semi.err | 1 +
src/tests/fail-range-without-in.eq | 8 ++++++++

src/tests/fail-range-without-in.err | 1 +
src/tests/fail-with-argument-missing-semi.eq | 8 ++++++++
src/tests/fail-with-argument-missing-semi.err | 1 +
8 files changed, 37 insertions(+)

commit b69da18acfc3616136af78de89d40f18721d04b8
Author: Ruicong Xie rx2119@columbia.edu
Date: Wed Apr 13 21:59:16 2016 -0400

test for illegal use of print with bop and uop

src/semant.ml | 7 ++++---
src/tests/fail-illegal-print-binop.eq | 8 ++++++++
src/tests/fail-illegal-print-binop.err | 1 +
src/tests/fail-illegal-print-unop.eq | 8 ++++++++
src/tests/fail-illegal-print-unop.err | 1 +
src/tests/fail-illegal-print.eq | 8 -----
src/tests/fail-illegal-print.err | 1 -
7 files changed, 22 insertions(+), 12 deletions(-)

commit 2bd8f0401a418b1f4208c3b5ce092875f94215fd
Author: Ruicong Xie rx2119@columbia.edu
Date: Wed Apr 13 21:44:27 2016 -0400

check built in argument length added a print fail test

src/semant.ml | 53 ++++++-----
src/tests/fail-cos-multi-assign.eq | 8 ++++++
src/tests/fail-cos-multi-assign.err | 1 +
src/tests/fail-illegal-print.eq | 8 ++++++
src/tests/fail-illegal-print.err | 1 +
5 files changed, 54 insertions(+), 17 deletions(-)

commit 49682c9fa8abd8d8eadd09fc2d54d0abf41fff17
Author: Tianci Zhong tz2278@columbia.edu
Date: Wed Apr 13 21:31:01 2016 -0400

update lrm for range

notes/language-reference-manual.md | 40 ++++++-----
1 file changed, 23 insertions(+), 17 deletions(-)

commit 15b7647c417fe155a9b6daf6212dc1aeb610071a
Author: Tianci Zhong tz2278@columbia.edu
Date: Wed Apr 13 21:29:30 2016 -0400

update error message for fail range test

src/tests/fail-range-with-string-passedin.err | 2 +-
src/tests/fail-range-with-string-passedin1.err | 2 +-
2 files changed, 2 insertions(+), 2 deletions(-)

commit 9fa5246fd07fb9600a132970a27d12aa2f479314
Author: Tianci Zhong tz2278@columbia.edu
Date: Wed Apr 13 21:27:49 2016 -0400

update lrm and change prompt error for range

src/semant.ml | 6 +++---
1 file changed, 3 insertions(+), 3 deletions(-)

commit 80ed7b39a8f2ae831e520f10f8e83647d38d81e2
Author: Tianci Zhong tz2278@columbia.edu
Date: Wed Apr 13 21:16:08 2016 -0400

update fail test for range

src/tests/fail-range-with-string-passedin.eq | 7 +-
src/tests/fail-range-with-string-passedin1.eq | 9 +++++++
src/tests/fail-range-with-string-passedin1.err | 1 +
src/tests/fail-range-without-arguments.eq | 7 +-
4 files changed, 14 insertions(+), 10 deletions(-)

commit 1d7fdebb8f23a524fb4e3187002665c131dc7bca
Author: Tianci Zhong tz2278@columbia.edu
Date: Wed Apr 13 21:09:55 2016 -0400

update semant for range

src/semant.ml | 15 +++++++
src/tests/fail-range-with-string-passedin.eq | 12 +++++++
src/tests/fail-range-with-string-passedin.err | 1 +
3 files changed, 28 insertions(+)

commit 04748874112f2390d028165a82882e9499f9d76e
Author: Ruicong Xie rx2119@columbia.edu
Date: Wed Apr 13 20:41:10 2016 -0400

more respectable nested test

src/tests/test-nested-builtin.eq | 2 +-
src/tests/test-nested-builtin.out | 2 +-
2 files changed, 2 insertions(+), 2 deletions(-)

commit 511edc19777d1f81b21516e861e304bfdd78d4a7
Author: Ruicong Xie rx2119@columbia.edu
Date: Wed Apr 13 20:25:54 2016 -0400

full sets of fail tests

src/tests/fail-cos-illegal-arg-assign.eq | 8 +++++++
src/tests/fail-cos-illegal-arg-assign.err | 1 +
src/tests/fail-cos-illegal-arg-str.eq | 8 +++++++
src/tests/fail-cos-illegal-arg-str.err | 1 +
src/tests/fail-log-illegal-arg-assign.eq | 8 +++++++
src/tests/fail-log-illegal-arg-assign.err | 1 +
src/tests/fail-log-illegal-arg-str.eq | 8 +++++++
src/tests/fail-log-illegal-arg-str.err | 1 +
src/tests/fail-log-less-zero.eq | 8 -----
src/tests/fail-log-less-zero.err | 1 -
src/tests/fail-log-less-zero0.eq | 8 -----
src/tests/fail-log-less-zero0.err | 1 -
src/tests/fail-sin-illegal-arg-assign.eq | 8 +++++++
src/tests/fail-sin-illegal-arg-assign.err | 1 +

src/tests/fail-sin-illegal-arg-str.eq | 8 ++++++++
src/tests/fail-sin-illegal-arg-str.err | 1 +
src/tests/fail-sqrt-illegal-arg-assign.eq | 8 ++++++++
src/tests/fail-sqrt-illegal-arg-assign.err | 1 +
src/tests/fail-sqrt-illegal-arg-str.eq | 8 ++++++++
src/tests/fail-sqrt-illegal-arg-str.err | 1 +
src/tests/fail-tan-illegal-arg-assign.eq | 8 ++++++++
src/tests/fail-tan-illegal-arg-assign.err | 1 +
src/tests/fail-tan-illegal-arg-str.eq | 8 ++++++++
src/tests/fail-tan-illegal-arg-str.err | 1 +
24 files changed, 90 insertions(+), 18 deletions(-)

commit 4b06335b208ed9136a1228b3576e2348e5f4175a
Author: Ruicong Xie rx2119@columbia.edu
Date: Wed Apr 13 20:06:30 2016 -0400

condensed semant check

src/semant.ml | 20 ++++++++-----
1 file changed, 11 insertions(+), 9 deletions(-)

commit a89d08cbb495e3b7d18797ad21d572df63c1b90d
Author: Ruicong Xie rx2119@columbia.edu
Date: Wed Apr 13 20:05:29 2016 -0400

corrected typo

src/tests/fail-built-in-print-in-ctx.err | 2 +-
src/tests/fail-built-in-print-in-find.err | 2 +-
2 files changed, 2 insertions(+), 2 deletions(-)

commit b8004daafcee687992ae0f256c0009812447c197
Author: Ruicong Xie rx2119@columbia.edu
Date: Wed Apr 13 19:45:14 2016 -0400

additional test and semant check for built-in

src/semant.ml | 15 ++++++++-----
src/tests/fail-log-less-zero0.eq | 8 ++++++++
src/tests/fail-log-less-zero0.err | 1 +
src/tests/fail-sqrt-str-arg.eq | 8 ++++++++
src/tests/fail-sqrt-str-arg.err | 1 +
src/tests/test-nested-builtin.eq | 9 ++++++++
src/tests/test-nested-builtin.out | 1 +
7 files changed, 41 insertions(+), 2 deletions(-)

commit 93699aeb610cffafa497c95dc741e161ec5abc0a
Author: Tianci Zhong tz2278@columbia.edu
Date: Wed Apr 13 19:34:01 2016 -0400

clean up trailing whitespace

src/ast.ml | 14 ++++++-----
src/parser.mly | 2 +-
src/semant.ml | 34 ++++++++-----
3 files changed, 25 insertions(+), 25 deletions(-)

commit a456d00e824edc2a4cbeade8fb237ec3d3284703
Author: Tianci Zhong tz2278@columbia.edu
Date: Wed Apr 13 19:22:33 2016 -0400

clean up the trailing whitespace

src/codegen.ml | 78 ++++++-----
1 file changed, 39 insertions(+), 39 deletions(-)

commit e3ac45a0556632d0d3656427203000e083b53b7d
Author: Tianci Zhong tz2278@columbia.edu
Date: Wed Apr 13 19:03:05 2016 -0400

add fail test for range without arguments

src/tests/fail-range-without-arguments.eq | 12 ++++++
src/tests/fail-range-without-arguments.err | 1 +
2 files changed, 13 insertions(+)

commit 52d4754f84e2c900fd0a8bd424e2e0c24488f66f
Author: Tianci Zhong tz2278@columbia.edu
Date: Wed Apr 13 18:52:08 2016 -0400

update LRM

notes/language-reference-manual.md | 21 ++++++-----
1 file changed, 11 insertions(+), 10 deletions(-)

commit 5f32e12beeb2d8fa2f60649e7cfc2f8d1d900a75
Author: Ruicong Xie rx2119@columbia.edu
Date: Wed Apr 13 18:45:04 2016 -0400

built in constraint check

src/semant.ml | 62 ++++++-----
src/tests/fail-log-less-zero.eq | 2 +
src/tests/fail-log-less-zero.err | 2 +
src/tests/fail-log-zero.eq | 8 +++++
src/tests/fail-log-zero.err | 1 +
src/tests/fail-sqrt-less-zero.eq | 8 +++++
src/tests/fail-sqrt-less-zero.err | 1 +
7 files changed, 40 insertions(+), 44 deletions(-)

commit c6ec34e0ec5356d9728edc16a6443ef182a1293c
Author: Tianci Zhong tz2278@columbia.edu
Date: Wed Apr 13 18:43:18 2016 -0400

change codegen with formatter

src/codegen.ml | 17 ++++++-----
1 file changed, 8 insertions(+), 9 deletions(-)

commit 40066ec763ba1e4036e163adc9adfd6b8459913b
Author: Tianci Zhong tz2278@columbia.edu
Date: Wed Apr 13 18:26:53 2016 -0400

range with one, two, or three arguments

```
src/ast.ml | 18 ++++++-----  
src/codegen.ml | 36 ++++++-----  
src/parser.mly | 4 +++-  
src/tests/test-range.eq | 20 ++++++--  
src/tests/test-range.out | 30 ++++++-----  
5 files changed, 87 insertions(+), 21 deletions(-)
```

commit 2a4f91639649c72293122910293c20ea5456e58c
Author: Ruicong Xie rx2119@columbia.edu
Date: Wed Apr 13 17:18:39 2016 -0400

seperated tests for math lib header and correct output

```
src/tests/test-built-in-cos.eq | 8 ++++++  
src/tests/test-built-in-cos.out | 1 +  
src/tests/test-built-in-log.eq | 8 ++++++  
src/tests/test-built-in-log.out | 1 +  
src/tests/test-built-in-sin.eq | 7 ++++++  
src/tests/test-built-in-sin.out | 1 +  
src/tests/test-built-in-sqrt.eq | 8 ++++++  
src/tests/test-built-in-sqrt.out | 1 +  
src/tests/test-built-in-tan.eq | 8 ++++++  
src/tests/test-built-in-tan.out | 1 +  
src/tests/test-built-in-trig-sqrt-log.eq | 12 -----  
src/tests/test-built-in-trig-sqrt-log.out | 5 -----  
12 files changed, 44 insertions(+), 17 deletions(-)
```

commit cbfed6d46423312d7804133f5650af62ec0667d9
Author: Ruicong Xie rx2119@columbia.edu
Date: Wed Apr 13 17:08:34 2016 -0400

added builtin to check math lib

```
src/codegen.ml | 28 ++++++-----  
src/semant.ml | 42 ++++++-----  
2 files changed, 43 insertions(+), 27 deletions(-)
```

commit 72ceff433effa8d8b6603efbd146f7a1aa64235c
Author: Jonathan Zacsh jzacsh@gmail.com
Date: Wed Apr 13 16:24:34 2016 -0400

noop(readability) wrap long lines from ec65423644

```
src/semant.ml | 63 ++++++-----  
1 file changed, 37 insertions(+), 26 deletions(-)
```

commit ec65423644b0b761d8dafdf5f980cee2f78a5fd0
Author: Jonathan Zacsh jzacsh@gmail.com
Date: Wed Apr 13 16:16:55 2016 -0400

noop(readability): limit scope of ocaml functions

```
src/semant.ml | 99 ++++++-----  
1 file changed, 49 insertions(+), 50 deletions(-)
```

commit e206982abbc6bd2e13d4104dfb0bb03042172c55
Author: Jonathan Zacsh jzacsh@gmail.com
Date: Wed Apr 13 13:44:23 2016 -0400

fix in-progress sast walk broken w/new If-grammar

broken by last commit's merge[1] from master, pulling in new `If` grammar[2]
using `option` ocaml keyword.

[1]: merge: aed55455f3c617e5c65a15e
[2]: new `if`-grammar: 3a101cd6a9624b3d3cada75659264bbff5934072

src/semant.ml | 9 ++++++--
1 file changed, 7 insertions(+), 2 deletions(-)

commit 367233fc4eeeb93bb7cee7062c29e42206f8149d
Author: Jonathan Zacsh jzacsh@gmail.com
Date: Tue Apr 12 15:55:04 2016 -0400

doc: update high-level comments on compiler phases

src/eqeq.ml | 19 ++++++-----
1 file changed, 12 insertions(+), 7 deletions(-)

commit a480cd064901110844b4ebe98444d6dcbc9eb233
Author: Tianci Zhong tz2278@columbia.edu
Date: Tue Apr 12 01:33:30 2016 -0400

wrap the function in codegen

src/codegen.ml | 39 ++++++-----
src/tests/test-range.out | 10 ++++++---
2 files changed, 32 insertions(+), 17 deletions(-)

commit 417d7ab3c864331880df06bb221364fd75c55713
Author: Tianci Zhong tz2278@columbia.edu
Date: Tue Apr 12 00:28:06 2016 -0400

modify test

src/tests/test-range.eq | 3 +--
1 file changed, 1 insertion(+), 2 deletions(-)

commit b4452cf9c9fd717621a9124dee77318ca00d9d2b
Author: Jonathan Zacsh jzacsh@gmail.com
Date: Mon Apr 11 23:19:50 2016 -0400

implement shell of find-expr algo[1] for equations

1. implements all of the shell logic for Expression walk along `find` blocks,
and leaves gaping hole in *actual* if/else `Match EXPR` with:~-pseudocode[1]
2. adds string functions to show what this commit does:

```
```sh
make && ./eqeq.native -s < ./tests/test-lazyresolved-vars.eq
SomeCtx : {
 a : [b]
 b : [c]

 c : ```
 5.;
```

```
    ````
    "find_SomeCtx_0":
      a : [b]
      b : [c]

      c : ````
      5.;
    ````
 }
}
```

(Note how `find\_SomeCtx\_0` doesn't add, just copies for now; "gaping hole" in step 1)

3. adds a bit more explicit type information to existing sast printers

[1]: <https://github.com/rxie25/PLT2016Spring/blob/34bd0f5975a3e6a0/notes/whiteboard-eq-analysis.md#algorithm-in-pseuc>

```
src/sast.ml | 18 ++++++--
src/semant.ml | 65 ++++++-----
src/tests/fail-find-unrecognized-context.err | 2 +-
3 files changed, 75 insertions(+), 10 deletions(-)
```

commit 6f41ca0f31e40f371c5286eb3c9472c48f90d7c4  
Author: Jonathan Zacsh [jzacsh@gmail.com](mailto:jzacsh@gmail.com)  
Date: Mon Apr 11 23:19:39 2016 -0400

fix broken lint: new deps in Makefile

```
src/Makefile | 4 ++--
1 file changed, 2 insertions(+), 2 deletions(-)
```

commit 281bfabac7268017bef4bbc4d9bb29598fbf387e  
Author: Ruicong Xie [rx2119@columbia.edu](mailto:rx2119@columbia.edu)  
Date: Mon Apr 11 20:32:43 2016 -0400

revised error msg updated semant

```
src/semant.ml | 32 ++++++-----
src/tests/fail-built-in-print-in-ctx.err | 2 +-
src/tests/fail-built-in-print-in-find.err | 2 +-
3 files changed, 14 insertions(+), 22 deletions(-)
```

commit e6e14726b929d2567b9be2268538138d242b395e  
Author: kekeleila [lh2756@barnard.edu](mailto:lh2756@barnard.edu)  
Date: Mon Apr 11 20:00:23 2016 -0400

update codegen to change negative cond. to positive cond. for library

```
src/codegen.ml | 8 ++++----
1 file changed, 4 insertions(+), 4 deletions(-)
```

commit 6e7da48395796f3b1ab4df42bf2acfa827e30f9  
Author: kekeleila [lh2756@barnard.edu](mailto:lh2756@barnard.edu)  
Date: Mon Apr 11 18:57:03 2016 -0400

update semant.ml again to make it looks neat

```
src/semant.ml | 7 +++----
1 file changed, 3 insertions(+), 4 deletions(-)
```

commit 675e191ebffa879cf45d5d0f6afeaed9e08400f7

Author: Tianci Zhong [tz2278@columbia.edu](mailto:tz2278@columbia.edu)  
Date: Mon Apr 11 18:52:59 2016 -0400

add more test case

src/tests/test-negsign.eq | 5 +++++  
src/tests/test-negsign.out | 5 +++++  
2 files changed, 10 insertions(+)

commit 7b3e04576800a6241f184ead4d2b74cd3a100410  
Author: kekeleila [lh2756@barnard.edu](mailto:lh2756@barnard.edu)  
Date: Mon Apr 11 18:43:52 2016 -0400

cleanup semant.ml

src/semant.ml | 10 +++++-----  
1 file changed, 5 insertions(+), 5 deletions(-)

commit 9dc0797ede72bdc425a5a0f5c35dfdf09494cabf  
Author: Tianci Zhong [tz2278@columbia.edu](mailto:tz2278@columbia.edu)  
Date: Mon Apr 11 18:43:00 2016 -0400

add and change test for +/- in front of number

src/scanner.mll | 2 +-  
src/tests/fail-no-space-after-plus.eq | 7 -----  
src/tests/fail-no-space-after-plus.err | 1 -  
src/tests/test-negsign.eq | 13 ++++++++  
src/tests/test-negsign.out | 7 ++++++  
5 files changed, 21 insertions(+), 9 deletions(-)

commit b4d6bea061f26ce6a20ae0d7dfb227040d44ce1b  
Author: kekeleila [lh2756@barnard.edu](mailto:lh2756@barnard.edu)  
Date: Mon Apr 11 18:23:41 2016 -0400

update semant.ml to support calling library in if condition

src/semant.ml | 29 ++++++++-----  
1 file changed, 20 insertions(+), 9 deletions(-)

commit 652a540841bdb1af13175eed4c94f50c8042c944  
Author: Tianci Zhong [tz2278@columbia.edu](mailto:tz2278@columbia.edu)  
Date: Mon Apr 11 18:11:18 2016 -0400

modify test for our new rule according to +/- sgn and add fail test for invalid +/- sign usage

src/tests/fail-no-space-after-minus.eq | 7 ++++++  
src/tests/fail-no-space-after-minus.err | 1 +  
src/tests/fail-no-space-after-plus.eq | 7 ++++++  
src/tests/fail-no-space-after-plus.err | 1 +  
src/tests/test-else-if.eq | 4 ++--  
src/tests/test-else.eq | 4 ++--  
src/tests/test-if.eq | 4 ++--  
src/tests/test-plus.eq | 2 +-  
src/tests/test-while.eq | 2 +-  
9 files changed, 24 insertions(+), 8 deletions(-)

commit 13d73eaeef06b473ff94b58bc2b7c0aec59f1104  
Author: Jonathan Zacsh [jzacsh@gmail.com](mailto:jzacsh@gmail.com)  
Date: Mon Apr 11 17:56:28 2016 -0400

adds fail tests for our new `if`/`else if` syntax

src/tests/fail-else-if-bad-syntax.eq | 11 ++++++++  
src/tests/fail-else-if-bad-syntax.err | 1 +  
src/tests/fail-else-if-empty-predicate.eq | 11 ++++++++  
src/tests/fail-else-if-empty-predicate.err | 1 +  
src/tests/fail-if-empty-predicate.eq | 8 ++++++++  
src/tests/fail-if-empty-predicate.err | 1 +  
6 files changed, 33 insertions(+)

commit b46d1247f90414cc170c3b19e432a6bbbbc2a4bf  
Author: Tianci Zhong [tz2278@columbia.edu](mailto:tz2278@columbia.edu)  
Date: Mon Apr 11 17:14:06 2016 -0400

update test for range

src/codegen.ml | 2 +-  
src/tests/test-range.eq | 26 ++++++++  
src/tests/test-range.out | 32 ++++++++  
3 files changed, 58 insertions(+), 2 deletions(-)

commit fce74c8d4586edffc6486bf85c134c652077c92c  
Author: Ruicong Xie [rx2119@columbia.edu](mailto:rx2119@columbia.edu)  
Date: Mon Apr 11 16:18:12 2016 -0400

fail test for semant check builtin input

src/tests/fail-log-less-zero.eq | 8 ++++++++  
src/tests/fail-log-less-zero.err | 1 +  
2 files changed, 9 insertions(+)

commit f6311a7180ad343c9c01155417ac82ed8f56b49b  
Author: Ruicong Xie [rx2119@columbia.edu](mailto:rx2119@columbia.edu)  
Date: Mon Apr 11 15:57:12 2016 -0400

try to check input of built-in, too complicated will open a seperate pull request

src/semant.ml | 20 ++++++++  
1 file changed, 16 insertions(+), 4 deletions(-)

commit afd99369c7aa44175bed30ccc5325465fd262f4e  
Author: kekeleila [lh2756@barnard.edu](mailto:lh2756@barnard.edu)  
Date: Mon Apr 11 15:50:31 2016 -0400

update semant.ml to accept newest version of if statement

src/semant.ml | 5 ++++  
1 file changed, 4 insertions(+), 1 deletion(-)

commit aa4e10aa714f75077b7e840d778778fdf592729a  
Author: Ruicong Xie [rx2119@columbia.edu](mailto:rx2119@columbia.edu)  
Date: Mon Apr 11 15:07:53 2016 -0400

added additional built-in stmt trig log sqrt

src/semant.ml | 12 ++++++++  
src/tests/test-built-in-trig-sqrt-log.eq | 12 ++++++++  
src/tests/test-built-in-trig-sqrt-log.out | 5 +++++  
3 files changed, 28 insertions(+), 1 deletion(-)

commit 6637bf1727a0f0b1900320766d3c22b5d77f5ae4  
Author: Tianci Zhong [tiancizhong@users.noreply.github.com](mailto:tiancizhong@users.noreply.github.com)  
Date: Mon Apr 11 14:57:29 2016 -0400

add notes for git diff

src/CONTRIBUTING.md | 9 ++++++++  
1 file changed, 9 insertions(+)

commit c14ed2b8f4ed140d5225537bb0f3cf9d1517b049  
Author: Ruicong Xie [rx2119@columbia.edu](mailto:rx2119@columbia.edu)  
Date: Mon Apr 11 12:53:21 2016 -0400

added test for print in ctx, updated semant, updated test-number with 'print'

src/semant.ml | 12 ++++++++--  
src/tests/fail-built-in-print-in-ctx.eq | 8 ++++++++  
src/tests/fail-built-in-print-in-ctx.err | 1 +  
src/tests/fail-built-in-print-in-find.eq | 7 ++++++++  
src/tests/fail-built-in-print-in-find.err | 1 +  
src/tests/fail-built-in-print.eq | 7 -----  
src/tests/fail-built-in-print.err | 1 -  
src/tests/test-number.eq | 26 ++++++++-----  
8 files changed, 39 insertions(+), 24 deletions(-)

commit ff7f6c38c27bef91c2d4273b60a0bd47f89b8cf6  
Author: Tianci Zhong [tz2278@columbia.edu](mailto:tz2278@columbia.edu)  
Date: Mon Apr 11 01:46:22 2016 -0400

update pretty print

src/ast.ml | 2 +-  
1 file changed, 1 insertion(+), 1 deletion(-)

commit a5786ca658ec816b38869555c150767816045df2  
Author: Tianci Zhong [tz2278@columbia.edu](mailto:tz2278@columbia.edu)  
Date: Mon Apr 11 01:43:35 2016 -0400

update pretty print

src/ast.ml | 9 ++++++++  
1 file changed, 9 insertions(+)

commit 5df6920396fe643d7de23ea20863f16a0091c89d  
Author: Jonathan Zacsh [jzacsh@gmail.com](mailto:jzacsh@gmail.com)  
Date: Mon Apr 11 01:35:56 2016 -0400

link to LRM feature-complete milestone tracker



src/README.md | 4 ++--  
1 file changed, 2 insertions(+), 2 deletions(-)

commit f92f6b660e9e59aec080e2dfe2d2eb9bb27f603f  
Author: Tianci Zhong [tz2278@columbia.edu](mailto:tz2278@columbia.edu)  
Date: Mon Apr 11 01:22:52 2016 -0400

clean up codegen

src/codegen.ml | 4 ----  
1 file changed, 4 deletions(-)

commit cf1e4d03a4e443de9ba06a1d16f3773fabd27d15  
Author: Jonathan Zacsh [jzacsh@gmail.com](mailto:jzacsh@gmail.com)  
Date: Mon Apr 11 01:21:32 2016 -0400

doc: no more excuses for broken stuff  
really need to implement all the things asap

src/README.md | 5 -----  
1 file changed, 5 deletions(-)

commit 46207a6c4d1ea5b4b56ca80dabe80d6489ef44a8  
Author: Tianci Zhong [tz2278@columbia.edu](mailto:tz2278@columbia.edu)  
Date: Mon Apr 11 01:20:45 2016 -0400

edit test for range

src/codegen.ml | 4 ++--  
src/tests/test-range.eq | 13 ++++++++---  
src/tests/test-range.out | 24 ++++++++-----  
3 files changed, 27 insertions(+), 14 deletions(-)

commit e4e6f2b750efe033a699f52829a71cb8804d7d34  
Author: Jonathan Zacsh [jzacsh@gmail.com](mailto:jzacsh@gmail.com)  
Date: Mon Apr 11 01:16:07 2016 -0400

doc fix href in toc to "scanner" debug tip

src/README.md | 2 +-  
1 file changed, 1 insertion(+), 1 deletion(-)

commit 7c63b6ca8ac22b7663c4878809f769b11323f043  
Author: Jonathan Zacsh [jzacsh@gmail.com](mailto:jzacsh@gmail.com)  
Date: Mon Apr 11 01:14:54 2016 -0400

document `sast` as "phase" debugging tip  
adds `sast.ml` pretty printing to docs  
(most of this diff just organizes existing stuff into sensible header-list)

src/README.md | 45 ++++++++-----  
1 file changed, 20 insertions(+), 25 deletions(-)

commit ef3c1b9cc08e5695ec590699211c2c2bdc30645c  
Author: Tianci Zhong [tz2278@columbia.edu](mailto:tz2278@columbia.edu)

Date: Mon Apr 11 00:55:28 2016 -0400

update basic range

src/codegen.ml | 55 ++++++-----  
src/parser.mly | 21 ++++++-----  
src/tests/test-range.eq | 1 +  
src/tests/test-range.out | 3 +++  
4 files changed, 57 insertions(+), 23 deletions(-)

commit 4687710cc4e9d702e3d52fde3775e7a1e833e6f8  
Author: Ruicong Xie [rx2119@columbia.edu](mailto:rx2119@columbia.edu)  
Date: Sun Apr 10 23:57:16 2016 -0400

added fail test for built-in

src/tests/fail-built-in-print.eq | 7 ++++++  
src/tests/fail-built-in-print.err | 1 +  
2 files changed, 8 insertions(+)

commit fc4cb9e8e43558af29e3f67dc5e6f758474f4ef6  
Author: Tianci Zhong [tz2278@columbia.edu](mailto:tz2278@columbia.edu)  
Date: Sun Apr 10 23:39:51 2016 -0400

change parser to add stmt\_list for find

src/parser.mly | 12 ++++++-----  
1 file changed, 6 insertions(+), 6 deletions(-)

commit 172f446e9a51f04dbe43748172a4046eafe5c752  
Author: Nam Hoang [nh2110@columbia.edu](mailto:nh2110@columbia.edu)  
Date: Sun Apr 10 20:27:31 2016 -0400

Implement string\_of for `deps` and `indeps`  
TODO string\_of\_find

src/sast.ml | 22 ++++++-----  
1 file changed, 15 insertions(+), 7 deletions(-)

commit 905608d593028bc620e21db3cc15f6110e2e6a30  
Author: Nam Hoang [nh2110@columbia.edu](mailto:nh2110@columbia.edu)  
Date: Sun Apr 10 20:26:10 2016 -0400

Change test so that it doesn't use with and better for testing

src/tests/test-lazyresolved-vars.eq | 7 +++++--  
1 file changed, 5 insertions(+), 2 deletions(-)

commit 6e908c68afdec6fe183db3170f43ddd4c69d11c  
Author: Nam Hoang [nh2110@columbia.edu](mailto:nh2110@columbia.edu)  
Date: Sun Apr 10 19:59:13 2016 -0400

skeleton for pretty print the SAST

src/eqeq.ml | 4 +++-  
src/sast.ml | 22 ++++++-----  
2 files changed, 24 insertions(+), 2 deletions(-)

commit fd44324bc71e887a2edf83c739a62508a22e9ef3  
Author: Tianci Zhong [tz2278@columbia.edu](mailto:tz2278@columbia.edu)  
Date: Sun Apr 10 19:49:07 2016 -0400

find with simple range testing

src/ast.ml | 4 ++++  
src/codegen.ml | 31 ++++++-----  
src/debugtokens.ml | 2 ++  
src/parser.mly | 31 ++++++-----  
src/scanner.ml | 2 ++  
src/tests/test-range.eq | 2 +-  
6 files changed, 62 insertions(+), 10 deletions(-)

commit 08d94ef9ca1101f38c6066b420357157bf19303e  
Author: Nam Hoang [nh2110@columbia.edu](mailto:nh2110@columbia.edu)  
Date: Sun Apr 10 19:21:24 2016 -0400

Complete first stage of Sast (convert bool to list)

Done with generating deps and indeps for all contexts' equations  
TODO: generate a map for `find` statements

src/semant.ml | 49 ++++++-----  
1 file changed, 22 insertions(+), 27 deletions(-)

commit 804f5d7ec6ca03b7a1e9926a79ac85d6878c02aa  
Author: Nam Hoang [nh2110@columbia.edu](mailto:nh2110@columbia.edu)  
Date: Sun Apr 10 18:48:06 2016 -0400

implements is Id in expr and add to indeps if false

src/sast.ml | 3 +-  
src/semant.ml | 88 ++++++-----  
2 files changed, 48 insertions(+), 43 deletions(-)

commit 364153458a9162e42c8f727718aad8da207fb85d  
Author: Tianci Zhong [tz2278@columbia.edu](mailto:tz2278@columbia.edu)  
Date: Sun Apr 10 17:35:58 2016 -0400

add test for range

src/tests/test-range.eq | 10 ++++++  
src/tests/test-range.out | 6 ++++++  
2 files changed, 16 insertions(+)

commit da1b08b31e4594610b7864c7c65b7a50ed9a5529  
Author: Tianci Zhong [tz2278@columbia.edu](mailto:tz2278@columbia.edu)  
Date: Sun Apr 10 17:20:50 2016 -0400

delete the unused find in stmt

src/parser.mly | 1 -

1 file changed, 1 deletion(-)

commit 815cc3bdb2aaedbd124ec4adfa88f7e75291178  
Author: Tianci Zhong [tz2278@columbia.edu](mailto:tz2278@columbia.edu)  
Date: Sun Apr 10 17:14:00 2016 -0400

update parser for with and add test

src/parser.mly | 11 +++++-----  
src/tests/test-with-multi-var.eq | 12 ++++++++  
src/tests/test-with-multi-var.out | 3 +++  
src/tests/test-with-one-var.eq | 10 ++++++++  
src/tests/test-with-one-var.out | 2 ++  
src/tests/test-with1.eq | 9 -----  
src/tests/test-with1.out | 2 --  
7 files changed, 32 insertions(+), 17 deletions(-)

commit faf8de431078c20b88428611e159a80afa06ea2d  
Author: Jonathan Zacsh [jzacsh@gmail.com](mailto:jzacsh@gmail.com)  
Date: Sun Apr 10 17:02:57 2016 -0400

sast: starts translating pseudocode[1] into ocaml

[1]: <https://github.com/rxie25/PLT2016Spring/blob/34bd0f5975a/notes/whiteboard-eq-analysis.md#algorithm-in-pseudocode>

src/sast.ml | 2 +-  
src/semant.ml | 60 ++++++++  
2 files changed, 61 insertions(+), 1 deletion(-)

commit ea0aa06797601d34eb9c462f498ee45bd86b8ab2  
Author: Ruicong Xie [rx2119@columbia.edu](mailto:rx2119@columbia.edu)  
Date: Sun Apr 10 16:40:14 2016 -0400

formatted code to be more readable and removed duplicated code

src/ast.ml | 7 +++++--  
src/codegen.ml | 14 ++++++++  
2 files changed, 15 insertions(+), 6 deletions(-)

commit 685305ca280581c971ec87281ac9ab3d9acc5167  
Author: Jonathan Zacsh [jzacsh@gmail.com](mailto:jzacsh@gmail.com)  
Date: Sun Apr 10 15:47:14 2016 -0400

sast: fully detail relationship to `Ast.program`

src/sast.ml | 31 ++++++++  
1 file changed, 20 insertions(+), 11 deletions(-)

commit 20ca65f0e3581c5b7b5cfa23b733c5acae2da183  
Author: Jonathan Zacsh [jzacsh@gmail.com](mailto:jzacsh@gmail.com)  
Date: Sun Apr 10 15:01:59 2016 -0400

noop(readability) create documented SAST API[1]

"API" here refers to output of `semant.ml`, which becomes the input of  
`codegen.ml`

src/Makefile | 10 ++++++----  
src/codegen.ml | 6 +++++-  
src/sast.ml | 11 ++++++  
src/semant.ml | 8 +++++-  
4 files changed, 27 insertions(+), 8 deletions(-)

commit b71f332235dac1c5306925c1c4c68df8468d9db9  
Author: Ruicong Xie [rx2119@columbia.edu](mailto:rx2119@columbia.edu)  
Date: Sun Apr 10 14:56:16 2016 -0400

updated pretty print

src/ast.ml | 19 ++++++-----  
1 file changed, 10 insertions(+), 9 deletions(-)

commit 2bf95037d38f9638b25831191b1dc8430ba0f65d  
Author: Jonathan Zacsh [jzacsh@gmail.com](mailto:jzacsh@gmail.com)  
Date: Sun Apr 10 14:53:27 2016 -0400

noop(readability) use newer[1] name `Ast.multi\_eq`  
[1]: as of d26c20571770c468b7ff1b28

src/ast.ml | 2 +-  
src/semant.ml | 4 ++--  
2 files changed, 3 insertions(+), 3 deletions(-)

commit 8e976034dc76acd5bcb3b0f9c382c36d034094ba  
Author: Ruicong Xie [rx2119@columbia.edu](mailto:rx2119@columbia.edu)  
Date: Sun Apr 10 14:50:24 2016 -0400

updated semant for if check

src/ast.ml | 2 +-  
src/codegen.ml | 16 ++++++-----  
src/parser.mly | 6 +++--  
src/semant.ml | 10 ++++++--  
4 files changed, 20 insertions(+), 14 deletions(-)

commit 3a101cd6a9624b3d3cada75659264bbff5934072  
Author: Ruicong Xie [rx2119@columbia.edu](mailto:rx2119@columbia.edu)  
Date: Sun Apr 10 14:08:09 2016 -0400

updated new type for if

src/ast.ml | 13 +++++-----  
1 file changed, 5 insertions(+), 8 deletions(-)

commit ea72bc2086c81551c8ad80a199efa57fec9281f1  
Author: Jonathan Zacsh [jzacsh@gmail.com](mailto:jzacsh@gmail.com)  
Date: Sun Apr 10 13:28:55 2016 -0400

bugfix(doc) unconfuse markdown parser  
thinks my checkbox is also my link.. can't disambiguate

src/README.md | 4 ++--

1 file changed, 2 insertions(+), 2 deletions(-)

commit 35becdc4eeffa26e4271396b0e4105e07822312  
Author: Jonathan Zacsh [jzacsh@gmail.com](mailto:jzacsh@gmail.com)  
Date: Sun Apr 10 13:24:59 2016 -0400

```
doc: update README status: successful "Hello World"
... Now moving onto Final Report issues
```

src/README.md | 16 ++++++-----  
1 file changed, 9 insertions(+), 7 deletions(-)

commit f013e1d586b0da5a51f4f2ce2781e2d1c9d00874  
Author: Jonathan Zacsh [jzacsh@gmail.com](mailto:jzacsh@gmail.com)  
Date: Sun Apr 10 13:20:46 2016 -0400

```
noop(docs) markdown link short-hand
this makes our doc more readable in plaintext (as it should be)
```

src/README.md | 22 ++++++-----  
1 file changed, 15 insertions(+), 7 deletions(-)

commit 307f40531e30e91789ccc29e6100a873811cf5f0  
Author: kekeleila [lh2756@barnard.edu](mailto:lh2756@barnard.edu)  
Date: Thu Apr 7 22:39:09 2016 -0400

```
update codegen.ml and semant.ml to generate header automatically
```

src/codegen.ml | 15 ++++++---  
src/semant.ml | 46 ++++++-----  
2 files changed, 56 insertions(+), 5 deletions(-)

commit 027d03849457b751167ba87c5bd5b8a39bea1e69  
Author: Ruicong Xie [rx2119@columbia.edu](mailto:rx2119@columbia.edu)  
Date: Thu Apr 7 14:59:15 2016 -0400

```
updated tests
```

src/tests/test-else.eq | 6 +++---  
src/tests/test-if.eq | 2 +-  
2 files changed, 4 insertions(+), 4 deletions(-)

commit c7bc59d628e5c88da0d8a7ce1ff417a2a7c93dcd  
Author: Ruicong Xie [rx2119@columbia.edu](mailto:rx2119@columbia.edu)  
Date: Thu Apr 7 14:57:57 2016 -0400

```
odified tests added grammar
```

src/parser.mly | 8 +++++---  
src/tests/test-elif.eq | 26 -----  
src/tests/test-elif.out | 4 ----  
src/tests/test-else-if.eq | 26 ++++++-----  
src/tests/test-else-if.out | 4 ++++  
5 files changed, 35 insertions(+), 33 deletions(-)

commit 8d64dcdf506618baa6c6035405b0354593d60066  
Author: Ruicong Xie [rx2119@columbia.edu](mailto:rx2119@columbia.edu)  
Date: Thu Apr 7 01:31:50 2016 -0400

restored string\_of\_expr in ast

src/ast.ml | 20 ++++++++-----  
1 file changed, 10 insertions(+), 10 deletions(-)

commit 36ad57e341d245e9743824c46771b504c491f462  
Author: Ruicong Xie [rx2119@columbia.edu](mailto:rx2119@columbia.edu)  
Date: Thu Apr 7 01:29:09 2016 -0400

added and modified tests for if elif

src/tests/test-elif.eq | 10 ++++++++  
src/tests/test-elif.out | 4 ++++  
src/tests/test-else.eq | 27 ++++++++  
src/tests/test-else.out | 4 ++++  
4 files changed, 45 insertions(+)

commit d7581c594935add9a4f0c0205130bf87843553e2  
Author: Ruicong Xie [rx2119@columbia.edu](mailto:rx2119@columbia.edu)  
Date: Thu Apr 7 01:27:46 2016 -0400

fixed elif issues

src/ast.ml | 26 ++++++++-----  
src/codegen.ml | 12 ++++++++--  
src/parser.mly | 8 +++-----  
3 files changed, 26 insertions(+), 20 deletions(-)

commit 412f0f8fd2115b50c51c286afd5cc2e01ecb0a98  
Author: Tianci Zhong [tz2278@columbia.edu](mailto:tz2278@columbia.edu)  
Date: Wed Apr 6 22:13:56 2016 -0400

add cast before print

src/codegen.ml | 8 ++++++--  
src/tests/test-arithmetic-basic.eq | 12 +++++-----  
2 files changed, 13 insertions(+), 7 deletions(-)

commit 81e122f2eb31636788ee4b39eca606d5d27c1df3  
Author: Ruicong Xie [rx2119@columbia.edu](mailto:rx2119@columbia.edu)  
Date: Wed Apr 6 21:10:22 2016 -0400

muted some semantic check for if statemnt

src/semant.ml | 7 ++-----  
1 file changed, 2 insertions(+), 5 deletions(-)

commit 5e08177f08046bdb6432006eac60babb897138ac  
Author: Ruicong Xie [rx2119@columbia.edu](mailto:rx2119@columbia.edu)  
Date: Wed Apr 6 21:09:49 2016 -0400

codegen using if pretty print which is not implemented correctly for all subsequent expressions

src/codegen.ml | 23 ++++++-----  
1 file changed, 12 insertions(+), 11 deletions(-)

commit c5f80d9b2de68379d4a6cdd122fb6ed25cd0683a  
Author: Ruicong Xie [rx2119@columbia.edu](mailto:rx2119@columbia.edu)  
Date: Wed Apr 6 21:08:23 2016 -0400

added a simple test for elif

src/tests/test-elif.eq | 16 ++++++  
1 file changed, 16 insertions(+)

commit 9593b0d51368d5dcb5a0f36ff76fce55561a5a55  
Author: Ruicong Xie [rx2119@columbia.edu](mailto:rx2119@columbia.edu)  
Date: Wed Apr 6 21:08:02 2016 -0400

changed if to include elif

src/ast.ml | 18 ++++++-----  
src/debugtokens.ml | 1 +  
src/parser.mly | 17 ++++++-----  
src/scanner.mll | 1 +  
4 files changed, 29 insertions(+), 8 deletions(-)

commit 6a0f3c1b47adf3d8b2df1948ab594d589f475d1f  
Author: kekeleila [lh2756@barnard.edu](mailto:lh2756@barnard.edu)  
Date: Wed Apr 6 15:26:48 2016 -0400

update to add continue/break

src/ast.ml | 6 ++++++  
src/codegen.ml | 3 +++  
src/debugtokens.ml | 2 ++  
src/parser.mly | 5 ++++  
src/scanner.mll | 2 ++  
src/semant.ml | 6 ++++++  
src/tests/test-break.eq | 9 ++++++  
src/tests/test-break.out | 1 +  
src/tests/test-continue.eq | 11 ++++++  
src/tests/test-continue.out | 2 ++  
10 files changed, 46 insertions(+), 1 deletion(-)

commit 3a28979e6329563025830720e12a8eb551507d2a  
Author: Jimmy Xie [rxie25@gmail.com](mailto:rxie25@gmail.com)  
Date: Tue Apr 5 23:22:54 2016 -0400

updated output for multi-line-equation

src/tests/test-multi-equation.out | 2 +-  
1 file changed, 1 insertion(+), 1 deletion(-)

commit 5f52872ed4178fbddec4e2bad3fb1acd0a8871b  
Author: Jimmy Xie [rxie25@gmail.com](mailto:rxie25@gmail.com)  
Date: Tue Apr 5 23:22:10 2016 -0400



updated multi-line equation test

src/tests/test-multi-equation.eq | 6 -----  
1 file changed, 6 deletions(-)

commit dbf08dc3f1d6e42ddf19ba32d419c37164db87ff  
Author: Tianci Zhong [tz2278@columbia.edu](mailto:tz2278@columbia.edu)  
Date: Tue Apr 5 22:55:18 2016 -0400

modify test-arithmetic-basic.eq and the output file

src/tests/test-arithmetic-basic.eq | 30 ++++++  
src/tests/test-arithmetic-basic.out | 15 ++++++-----  
src/tests/test-arithmetic-basic.skip.eq | 29 -----  
3 files changed, 38 insertions(+), 36 deletions(-)

commit 39cf8ee08ce10d7774371663a45a8e0adf5b76c9  
Author: Tianci Zhong [tz2278@columbia.edu](mailto:tz2278@columbia.edu)  
Date: Tue Apr 5 22:35:21 2016 -0400

change test-arithmetic-basic.skip.eq

src/tests/test-arithmetic-basic.skip.eq | 12 ++++++-----  
1 file changed, 6 insertions(+), 6 deletions(-)

commit 34bd0f5975a3e6a0ef5bd3028d8a57cdb55707a5  
Author: Jonathan Zacsh [jzacsh@gmail.com](mailto:jzacsh@gmail.com)  
Date: Tue Apr 5 20:12:08 2016 -0400

doc: note current effort in TODO

notes/whiteboard-eq-analysis.md | 1 +  
1 file changed, 1 insertion(+)

commit 4a3df7b50386f78cf0bfbf13bcc203ca451d2c2f  
Author: Jonathan Zacsh [jzacsh@gmail.com](mailto:jzacsh@gmail.com)  
Date: Tue Apr 5 20:06:23 2016 -0400

doc: rm out-dated TODO for whiteboard

notes/whiteboard-eq-analysis.md | 2 --  
1 file changed, 2 deletions(-)

commit 890a6350621a2425de38fd85ab51a18a604f5289  
Author: Jonathan Zacsh [jzacsh@gmail.com](mailto:jzacsh@gmail.com)  
Date: Tue Apr 5 20:00:40 2016 -0400

doc: fix spelling mistakes

notes/whiteboard-eq-analysis.md | 16 ++++++-----  
1 file changed, 8 insertions(+), 8 deletions(-)

commit 430dbdf7f02965f0ec9c075af496bec2f8e9b33d  
Author: Jonathan Zacsh [jzacsh@gmail.com](mailto:jzacsh@gmail.com)  
Date: Tue Apr 5 19:54:27 2016 -0400

describing sast from design doc as an ocaml type[1]

[1]: type \*of types\*... not sure how else to structure this

src/Makefile | 2 ++  
src/sast.ml | 22 ++++++  
2 files changed, 24 insertions(+)

commit f4f0efa45d8c430842fd5fad3d727d15b9c24c80  
Author: Jonathan Zacsh [jzacsh@gmail.com](mailto:jzacsh@gmail.com)  
Date: Tue Apr 5 18:58:17 2016 -0400

doc: `for find` \*parallel\* to `for` over contexts

notes/whiteboard-eq-analysis.md | 52 ++++++-----  
1 file changed, 26 insertions(+), 26 deletions(-)

commit 535a8444aa7fc873caa83d41aac177c2de3e915e  
Author: Jonathan Zacsh [jzacsh@gmail.com](mailto:jzacsh@gmail.com)  
Date: Tue Apr 5 18:18:42 2016 -0400

test: fixes err status masked by 1cf9a9c6ff

Was causing unexpected continued execution of script:

```
```sh
$ make test
... snipped ...
[21] "test-multi-equation"      asserting target's behavior      /media/terrahome/jzacsh-tmp/src/PLT2016Spring/src/tes
/media/terrahome/jzacsh-tmp/src/PLT2016Spring/src/tests/test-multi-equation.c:6:5: error: expected expression before
  a = if (3. > 4.)
      ^
      Result: FAIL
1c1
< 4
---
> ./bin//e2e-tests.sh: line 228: /media/terrahome/jzacsh-tmp/src/PLT2016Spring/src/tests/test-multi-equation.a: No su
```
```

src/bin/e2e-tests.sh | 4 +++-  
1 file changed, 3 insertions(+), 1 deletion(-)

commit 4d1ebc0ef7cfdcfdbea5a60e984a2853c9fbacd6  
Author: Ruicong Xie [rx2119@columbia.edu](mailto:rx2119@columbia.edu)  
Date: Tue Apr 5 10:47:55 2016 -0400

added test for multi line equations

src/tests/test-multi-equation.eq | 15 ++++++  
src/tests/test-multi-equation.out | 1 +  
2 files changed, 16 insertions(+)

commit bf10526a5b46a53edfc2e3288e6e6bc1d7189d55  
Author: Jonathan Zacsh [jzacsh@gmail.com](mailto:jzacsh@gmail.com)  
Date: Tue Apr 5 00:22:05 2016 -0400

doc: table of contents since examples are huge

(generated by doctoc)

notes/whiteboard-eq-analysis.md | 9 ++++++  
1 file changed, 9 insertions(+)

commit ff9ddc1dcaabf96fcbf48dcb1bce1c99fd225a5c  
Author: Jonathan Zacsh [jzacsh@gmail.com](mailto:jzacsh@gmail.com)  
Date: Tue Apr 5 00:14:52 2016 -0400

doc: fix bug in pseudocode's description of FIND block's unique str

notes/whiteboard-eq-analysis.md | 2 +-  
1 file changed, 1 insertion(+), 1 deletion(-)

commit flf593c01279589beb18f17436e4d904ab24f601  
Author: Jonathan Zacsh [jzacsh@gmail.com](mailto:jzacsh@gmail.com)  
Date: Tue Apr 5 00:13:09 2016 -0400

doc: JSON illustration of sast we imagined  
  
- a bit verbose: all the inherited/deep-copying of maps is done w/o comment  
- substitutes whiteboards; better than bad marker handwriting

notes/whiteboard-eq-analysis.md | 50 ++++++-----  
1 file changed, 42 insertions(+), 8 deletions(-)

commit 893a2948161c6bc9124d5b30a3a4bb6825951153  
Author: Jonathan Zacsh [jzacsh@gmail.com](mailto:jzacsh@gmail.com)  
Date: Tue Apr 5 00:11:44 2016 -0400

doc: pseudocode for codegen's use of sast of eq's

notes/whiteboard-eq-analysis.md | 34 ++++++  
1 file changed, 33 insertions(+), 1 deletion(-)

commit 368f68f9a95c531dd1d6b93d755c0b9b9740dfc1  
Author: Jonathan Zacsh [jzacsh@gmail.com](mailto:jzacsh@gmail.com)  
Date: Mon Apr 4 19:41:52 2016 -0400

doc: pseudocode for scoping in EqualsEquals

notes/whiteboard-eq-analysis.md | 49 ++++++--  
1 file changed, 47 insertions(+), 2 deletions(-)

commit 02f7288f977d7ffb784e1df76b32c70b38354546  
Author: Jonathan Zacsh [jzacsh@gmail.com](mailto:jzacsh@gmail.com)  
Date: Mon Apr 4 19:13:15 2016 -0400

doc: outline main sast data structure

notes/whiteboard-eq-analysis.md | 50 ++++++  
1 file changed, 50 insertions(+)

commit 324baf63b05083051c1b4d87b287ea9673476380  
Author: Jonathan Zacsh [jzacsh@gmail.com](mailto:jzacsh@gmail.com)  
Date: Mon Apr 4 18:52:16 2016 -0400

doc(semant->codegen) starting notes from whiteboard

notes/whiteboard-eq-analysis.md | 22 ++++++

1 file changed, 22 insertions(+)

commit e189e4b4fe4e2538d3de4179db46f1593e0e9bb3  
Author: Jonathan Zacsh [jzacsh@gmail.com](mailto:jzacsh@gmail.com)  
Date: Mon Apr 4 01:13:42 2016 -0400

```
testing: clarify LINT about newly-passing tests

For newly passing tets, `make lint` now outputs something like:
...
LINT FOUND: Some PASSING tests are unnecessarily skipped:
test-helloworld
test-mod
...
(if, say, `test-helloworld` and `test-mod` are marked skip, but actually pass)
```

src/bin/lint.sh | 19 ++++++-----  
1 file changed, 11 insertions(+), 8 deletions(-)

commit 1cf9a9c6ff9fbc3d6278753864c0fec0d39dd4c  
Author: Jonathan Zacsh [jzacsh@gmail.com](mailto:jzacsh@gmail.com)  
Date: Mon Apr 4 00:48:29 2016 -0400

```
tests: more inconsitent log output
```

src/bin/e2e-tests.sh | 6 +++--  
1 file changed, 3 insertions(+), 3 deletions(-)

commit 649d61786603c3495751ffb3d220e91067fd826b  
Author: Jonathan Zacsh [jzacsh@gmail.com](mailto:jzacsh@gmail.com)  
Date: Mon Apr 4 00:36:55 2016 -0400

```
tests: make `-p`lain output plainer[1]

[1]: in prep to make linter output better error messaging
```

src/bin/e2e-tests.sh | 72 ++++++-----  
src/bin/lint.sh | 2 +-  
2 files changed, 46 insertions(+), 28 deletions(-)

commit 22b8611c5edc15382569c247636e6e649562d759  
Author: Jonathan Zacsh [jzacsh@gmail.com](mailto:jzacsh@gmail.com)  
Date: Sun Apr 3 22:47:54 2016 -0400

```
noop(readability) cleanup printf args: just vars
```

src/bin/e2e-tests.sh | 4 ++-  
1 file changed, 2 insertions(+), 2 deletions(-)

commit 1ca753e290b56a4ea949773e0872a9de102e3a6e  
Author: Jonathan Zacsh [jzacsh@gmail.com](mailto:jzacsh@gmail.com)  
Date: Sun Apr 3 22:44:12 2016 -0400

```
tests: always print errors consistently to output as well as logs
```

src/bin/e2e-tests.sh | 4 ++-  
1 file changed, 2 insertions(+), 2 deletions(-)

commit 576822622b36aa050e314b03d00bdf97458be789  
Author: Jonathan Zacsh [jzacsh@gmail.com](mailto:jzacsh@gmail.com)  
Date: Sun Apr 3 22:31:00 2016 -0400

noop(readability): unindent else-branch

src/bin/e2e-tests.sh | 6 +++---  
1 file changed, 3 insertions(+), 3 deletions(-)

commit 2c6493adc941997c8f3e4ec8a9329ed34d887614  
Author: Jonathan Zacsh [jzacsh@gmail.com](mailto:jzacsh@gmail.com)  
Date: Sun Apr 3 22:26:47 2016 -0400

noop(tdd) clear columnar list of tests before run

src/bin/e2e-tests.sh | 10 ++++++++--  
1 file changed, 8 insertions(+), 2 deletions(-)

commit 018ed4f104f24bfe76911c4ba05fb5af56fc29c  
Author: Ruicong Xie [rx2119@columbia.edu](mailto:rx2119@columbia.edu)  
Date: Sun Apr 3 19:59:04 2016 -0400

added comments

src/tests/fail-undef-var-with-def-target.skip.eq | 2 +-  
src/tests/fail-undefined-variable.eq | 2 +-  
src/tests/fail-var-defined-in-diff-ctx.eq | 2 +-  
3 files changed, 3 insertions(+), 3 deletions(-)

commit cdf12130bdf5ac1b2348452a1458c34fd1d28a8e  
Author: Ruicong Xie [rx2119@columbia.edu](mailto:rx2119@columbia.edu)  
Date: Sun Apr 3 19:27:04 2016 -0400

re-edited a test, currently cant' pass, added skip

src/tests/fail-undef-var-with-def-target.eq | 11 -----  
src/tests/fail-undef-var-with-def-target.skip.eq | 12 ++++++++  
2 files changed, 12 insertions(+), 11 deletions(-)

commit 658d79dfb6e2d5374ecfc7702ed747533514b8bd  
Author: Ruicong Xie [rx2119@columbia.edu](mailto:rx2119@columbia.edu)  
Date: Sun Apr 3 19:15:20 2016 -0400

changed test files names

src/tests/fail-undef-var-with-def-target.eq | 11 ++++++++  
src/tests/fail-undef-var-with-def-target.err | 1 +  
src/tests/fail-undefined-variable.eq | 8 ++++++++  
src/tests/fail-undefined-variable.err | 1 +  
src/tests/fail-undefined-variable1.eq | 8 -----  
src/tests/fail-undefined-variable1.err | 1 -  
src/tests/fail-undefined-variable2.eq | 11 -----  
src/tests/fail-undefined-variable2.err | 1 -  
src/tests/fail-undefined-variable3.eq | 11 -----  
src/tests/fail-undefined-variable3.err | 1 -  
src/tests/fail-var-defined-in-diff-ctx.eq | 11 ++++++++

src/tests/fail-var-defined-in-diff-ctx.eq.err | 1 +  
12 files changed, 33 insertions(+), 33 deletions(-)

commit 9c46102a50facfe161dc222e386b8fcc47591906  
Author: Tianci Zhong [tz2278@columbia.edu](mailto:tz2278@columbia.edu)  
Date: Sun Apr 3 18:50:33 2016 -0400

delete comment in codegen and change test-print-findseperate test

src/codegen.ml | 1 -  
src/tests/test-print-findseperate.eq | 6 ++++--  
src/tests/test-print-findseperate.out | 6 ++++--  
3 files changed, 8 insertions(+), 5 deletions(-)

commit d4748e34f6b7f949d7777a10c23cb4d164f50a48  
Author: Jonathan Zacsh [jzacsh@gmail.com](mailto:jzacsh@gmail.com)  
Date: Sun Apr 3 18:48:00 2016 -0400

fix irrelevant EqEq \*syntax\* error in fail-test

src/tests/fail-lazyresolved-vars.eq | 2 +-  
1 file changed, 1 insertion(+), 1 deletion(-)

commit 27d1fe61ea99736838c774a94cd3304b99906cf2  
Author: Tianci Zhong [tz2278@columbia.edu](mailto:tz2278@columbia.edu)  
Date: Sun Apr 3 18:37:21 2016 -0400

fix test

src/scanner.mll | 4 ++--  
src/tests/fail-parser-tries-to-show-token.eq | 2 +-  
src/tests/fail-parser-tries-to-show-token.err | 2 +-  
3 files changed, 4 insertions(+), 4 deletions(-)

commit 97b829ef76b80808784ff03a195fa2217ac41c3e  
Author: Tianci Zhong [tz2278@columbia.edu](mailto:tz2278@columbia.edu)  
Date: Sun Apr 3 18:27:14 2016 -0400

fix the new line

src/scanner.mll | 4 +++-  
1 file changed, 3 insertions(+), 1 deletion(-)

commit 7ea1628bf280ba64ae09f9acf57e5328175a5acf  
Author: Jonathan Zacsh [jzacsh@gmail.com](mailto:jzacsh@gmail.com)  
Date: Sun Apr 3 18:22:44 2016 -0400

point out my code is broken

src/tests/fail-parser-tries-to-show-token.eq | 7 +++----  
src/tests/fail-parser-tries-to-show-token.err | 2 +-  
2 files changed, 4 insertions(+), 5 deletions(-)

commit 73155d60ad433f646dd9f1ba358ec33dfc6856de  
Author: Nam Hoang [nh2110@columbia.edu](mailto:nh2110@columbia.edu)  
Date: Sun Apr 3 18:00:10 2016 -0400

noop(readability): update comment for check\_stmt

src/semant.ml | 2 +-  
1 file changed, 1 insertion(+), 1 deletion(-)

commit f54e5abc248fde466454ee469694a83c85bd0bf5  
Author: Nam Hoang [nh2110@columbia.edu](mailto:nh2110@columbia.edu)  
Date: Sun Apr 3 17:40:26 2016 -0400

add check\_stmt\_for\_find so that we can implement rules separately for finddecl

src/semant.ml | 41 ++++++-----  
1 file changed, 34 insertions(+), 7 deletions(-)

commit 7ffa1de8edfe5f64a178a05580ea521218f11ede  
Author: Jonathan Zacsh [jzacsh@gmail.com](mailto:jzacsh@gmail.com)  
Date: Sun Apr 3 17:27:33 2016 -0400

strip down[1] line/char error and update some doc

[1]: for now, don't output tail, but would be nice if we output the previous 15  
and next 15 chars or so

src/eqeq.ml | 16 ++++++-----  
src/tests/fail-parser-tries-to-show-token.err | 2 +-  
2 files changed, 10 insertions(+), 8 deletions(-)

commit 2cda9f71bfa787b8c6167a455c54f3c99fa22bb9  
Author: Ruicong Xie [rx2119@columbia.edu](mailto:rx2119@columbia.edu)  
Date: Sun Apr 3 17:03:58 2016 -0400

semant find block variable in varmap still in progress

src/semant.ml | 18 ++++++-----  
1 file changed, 18 insertions(+)

commit 4d0f3ec6cf32b0aa634f191c138ec9e7b3b9e8ce  
Author: Nam Hoang [nh2110@columbia.edu](mailto:nh2110@columbia.edu)  
Date: Sun Apr 3 16:58:08 2016 -0400

get exception handling working

src/eqeq.ml | 16 ++++++-----  
src/scanner.mll | 4 ++++  
2 files changed, 15 insertions(+), 5 deletions(-)

commit c10fc9e57366b859a580a30051ad604df8c29243  
Author: Tianci Zhong [tz2278@columbia.edu](mailto:tz2278@columbia.edu)  
Date: Sun Apr 3 16:42:41 2016 -0400

change skipped test to not skip

src/tests/test-print-multi-find.eq | 15 ++++++-----  
src/tests/test-print-multi-find.skip.eq | 15 -----  
2 files changed, 15 insertions(+), 15 deletions(-)

commit 2146556990e517f6f73f0c5951eedb813df18687  
Author: Tianci Zhong [tz2278@columbia.edu](mailto:tz2278@columbia.edu)  
Date: Sun Apr 3 16:32:24 2016 -0400

enable same context with multiple find function being print

src/codegen.ml | 28 ++++++-----  
src/tests/test-print-findseperate.eq | 8 ++++++-  
src/tests/test-print-findseperate.out | 3 +-  
3 files changed, 29 insertions(+), 10 deletions(-)

commit 322e546eb0e5efd35101594e7155fa3515408ff6  
Author: Jonathan Zacsh [jzacsh@gmail.com](mailto:jzacsh@gmail.com)  
Date: Sun Apr 3 16:31:01 2016 -0400

boilerplate for usage of `Lexing.\*` APIs

src/eqeq.ml | 19 ++++++--  
1 file changed, 17 insertions(+), 2 deletions(-)

commit d593b2fdafdb7e5531748cdddee71e28ab807561  
Author: Jonathan Zacsh [jzacsh@gmail.com](mailto:jzacsh@gmail.com)  
Date: Sun Apr 3 15:26:49 2016 -0400

get eq compiler to point (vaguely) to the problem

src/tests/fail-parser-tries-to-show-token.eq | 9 ++++++  
src/tests/fail-parser-tries-to-show-token.err | 1 +  
2 files changed, 10 insertions(+)

commit 403a25f1f10187ac8705ab90473d861888bb6d1d  
Author: Jonathan Zacsh [jzacsh@gmail.com](mailto:jzacsh@gmail.com)  
Date: Sun Apr 3 14:45:49 2016 -0400

tdd: show (per LRM) intended var-detection

src/tests/fail-lazyresolved-vars.eq | 7 ++++++  
src/tests/fail-lazyresolved-vars.err | 2 ++  
src/tests/test-lazyresolved-vars.eq | 7 ++++++  
src/tests/test-lazyresolved-vars.out | 1 +  
4 files changed, 17 insertions(+)

commit ef1606348eccfbb1f0bb056252d9ba9c953a7c6  
Author: Jonathan Zacsh [jzacsh@gmail.com](mailto:jzacsh@gmail.com)  
Date: Sun Apr 3 14:35:34 2016 -0400

noop(readability) don't expose APIs unnecessarily

src/semant.ml | 32 ++++++-----  
1 file changed, 16 insertions(+), 16 deletions(-)

commit ca994ca794d81e2d4d840aea50c8b03337db1f15  
Author: Tianci Zhong [tz2278@columbia.edu](mailto:tz2278@columbia.edu)  
Date: Sun Apr 3 13:03:38 2016 -0400



brutly make find as a function in c without checking the semantic table part.

src/codegen.ml | 17 ++++++++-----  
1 file changed, 12 insertions(+), 5 deletions(-)

commit f46b54af7e64c0daedf2b7861f3d563463bd21b5  
Author: Ruicong Xie [rx2119@columbia.edu](mailto:rx2119@columbia.edu)  
Date: Sun Apr 3 13:02:35 2016 -0400

modified the variable test to reflect find block variable problem

src/tests/fail-undefined-variable3.eq | 4 ++--  
1 file changed, 2 insertions(+), 2 deletions(-)

commit 4b5a32ec1c6d0b88f75ceb9a6c746388db7dd4c5  
Author: Ruicong Xie [rx2119@columbia.edu](mailto:rx2119@columbia.edu)  
Date: Sun Apr 3 12:43:13 2016 -0400

added one more fail tet where variable names differ in find block

src/tests/fail-undefined-variable3.eq | 11 ++++++++  
src/tests/fail-undefined-variable3.err | 1 +  
2 files changed, 12 insertions(+)

commit bd366f01271ea11a1d47f5945f109e86c9769830  
Author: Nam Hoang [nh2110@columbia.edu](mailto:nh2110@columbia.edu)  
Date: Sun Apr 3 11:38:51 2016 -0400

replace `known\_ctxs` with `varmap` since they're doing similar things

src/semant.ml | 47 ++++++++-----  
1 file changed, 17 insertions(+), 30 deletions(-)

commit 85d121a0d120dee437abd99766b1f0fe202e743c  
Author: Nam Hoang [nh2110@columbia.edu](mailto:nh2110@columbia.edu)  
Date: Sun Apr 3 11:38:11 2016 -0400

remove unnecessary parts... doesn't change the logic

src/codegen.ml | 4 +---  
1 file changed, 1 insertion(+), 3 deletions(-)

commit c72dd2b39f04bca3209002e9dddbe91cb4dc735  
Author: Ruicong Xie [rx2119@columbia.edu](mailto:rx2119@columbia.edu)  
Date: Sun Apr 3 11:37:51 2016 -0400

added 1 more test for undefined variable

src/tests/fail-undefined-variable.err | 1 -  
src/tests/fail-undefined-variable.skip.eq | 8 -----  
src/tests/fail-undefined-variable1.eq | 8 ++++++++  
src/tests/fail-undefined-variable1.err | 1 +  
src/tests/fail-undefined-variable2.eq | 11 ++++++++  
src/tests/fail-undefined-variable2.err | 1 +  
6 files changed, 21 insertions(+), 9 deletions(-)

commit 1fd4062f82a0154dade7253f7ab3d91f561dd603  
Author: Nam Hoang [nh2110@columbia.edu](mailto:nh2110@columbia.edu)  
Date: Sun Apr 3 11:00:47 2016 -0400

improve codes... should make any change in functionality

src/semant.ml | 19 ++++++-----  
src/tests/test-var-appear-multiple-times.eq | 2 +-  
src/tests/test-var-appear-multiple-times.out | 2 +-  
3 files changed, 9 insertions(+), 14 deletions(-)

commit 0ad5347b45a186f0ade2af090f7408b5ba2707e1  
Author: Ruicong Xie [rx2119@columbia.edu](mailto:rx2119@columbia.edu)  
Date: Sat Apr 2 21:39:22 2016 -0400

removed unnecessary contxt from test

src/tests/fail-undefined-variable.skip.eq | 3 ---  
1 file changed, 3 deletions(-)

commit aca38d28a0168ead7603a00f0d7e20688066bfd6  
Author: Nam Hoang [nh2110@columbia.edu](mailto:nh2110@columbia.edu)  
Date: Sat Apr 2 18:10:00 2016 -0400

check for undefined variables

src/semant.ml | 12 ++++++----  
1 file changed, 8 insertions(+), 4 deletions(-)

commit 20bcb8fc527022df8c7445148816407341ad538f  
Author: Nam Hoang [nh2110@columbia.edu](mailto:nh2110@columbia.edu)  
Date: Sat Apr 2 18:09:33 2016 -0400

move varmap to the beginning so that we could make use of it in the future

src/semant.ml | 46 ++++++-----  
1 file changed, 23 insertions(+), 23 deletions(-)

commit 6f5f5ab9ef9daecbf8a6629faf5dc5cf815c3f41  
Author: Nam Hoang [nh2110@columbia.edu](mailto:nh2110@columbia.edu)  
Date: Sat Apr 2 17:41:33 2016 -0400

fix typo in test file; remove .skip

src/tests/fail-undefined-variable.err | 1 -  
src/tests/fail-undefined-variable.skip.eq | 11 -----  
src/tests/fail-undefined-variable.eq | 11 ++++++-----  
src/tests/fail-undefined-variable.err | 1 +  
4 files changed, 12 insertions(+), 12 deletions(-)

commit 8db8b901ccf51ef57bfd6c6439228aaac264345  
Author: Nam Hoang [nh2110@columbia.edu](mailto:nh2110@columbia.edu)  
Date: Sat Apr 2 16:14:59 2016 -0400

add test for the case: 1 variable in multiple contexts

src/tests/test-multiple-context-per-var.out | 1 +  
src/tests/test-multiple-context-per-var.skip.eq | 15 ++++++  
2 files changed, 16 insertions(+)

commit a55d25f0cc9d8af727c73e1253b616bdecba4481

Author: Nam Hoang [nh2110@columbia.edu](mailto:nh2110@columbia.edu)

Date: Sat Apr 2 16:04:07 2016 -0400

separate declarations from assignments

- pipe `varmap` from `semant` to `codegen`  
- use `varmap` to declare variables in `codegen`

Now, variables can be assigned multiple times in the case of only 1 context

src/codegen.ml | 16 ++++++----  
src/semant.ml | 2 +-  
2 files changed, 13 insertions(+), 5 deletions(-)

commit be72d01b5ae59153f600bdd5ef1c73538382a122

Author: Nam Hoang [nh2110@columbia.edu](mailto:nh2110@columbia.edu)

Date: Sat Apr 2 15:46:17 2016 -0400

noop(readability) change CtxMap to StringMap

No reason to change StringMap to CtxMap anymore

src/semant.ml | 14 ++++++-----  
1 file changed, 7 insertions(+), 7 deletions(-)

commit 8681efe512035349f53784639cebf1f41318ade3

Author: Nam Hoang [nh2110@columbia.edu](mailto:nh2110@columbia.edu)

Date: Sat Apr 2 15:40:02 2016 -0400

Revert "change variable names for readability"

No reason to change StringMap to CtxMap anymore

This reverts commit ce7b1a739b345690f4e13f4af6cfe445274210ba.

src/semant.ml | 14 ++++++-----  
1 file changed, 7 insertions(+), 7 deletions(-)

commit acb530cbf28602fb803654eeba442358b8f682a3

Author: Nam Hoang [nh2110@columbia.edu](mailto:nh2110@columbia.edu)

Date: Sat Apr 2 15:29:42 2016 -0400

create a simple symbol table in semant for codegen

src/semant.ml | 23 ++++++-----  
1 file changed, 18 insertions(+), 5 deletions(-)

commit 4b3fcbe1067660794f075cf0999efad50207fa74

Author: Jonathan Zacsh [jzacsh@gmail.com](mailto:jzacsh@gmail.com)

Date: Sat Apr 2 09:24:42 2016 -0400

revert to rx2119's regex in b8addb16, fixing float

- breakage revealed in eea560a0fe8  
- Broken by b8addb167ff

Keeping b8addb167ff's cleaned up regexp style, but reverting back to verbose multi-line expression.

src/scanner.mll | 7 ++++++  
1 file changed, 6 insertions(+), 1 deletion(-)

commit eea560a0fe80ad56863c63e18075d86ec6cc184b  
Author: Jonathan Zacsh [jzacsh@gmail.com](mailto:jzacsh@gmail.com)  
Date: Sat Apr 2 09:24:07 2016 -0400

tdd: better test to show float is curretly broken

src/tests/test-number.eq | 31 ++++++-----  
src/tests/test-number.out | 6 ++++++  
2 files changed, 21 insertions(+), 16 deletions(-)

commit 18da3a99ed78cb105332b57439d73218cf441398  
Author: Jonathan Zacsh [jzacsh@gmail.com](mailto:jzacsh@gmail.com)  
Date: Sat Apr 2 09:12:22 2016 -0400

floating point: better regexp, but broken by ``.42``

src/scanner.mll | 10 ++++++----  
src/tests/test-number.eq | 43 ++++++-----  
src/tests/test-number.out | 6 ++++++  
3 files changed, 42 insertions(+), 17 deletions(-)

commit 7e11c6f6d02c62d178f7c9a2a8ac07a85fda93e3  
Author: Ruicong Xie [rx2119@columbia.edu](mailto:rx2119@columbia.edu)  
Date: Sat Apr 2 02:00:29 2016 -0400

undefined varialbe fail test

src/tests/fail-undefined-varaible.err | 1 +  
src/tests/fail-undefined-varaible.skip.eq | 11 ++++++  
2 files changed, 12 insertions(+)

commit b95028d2b7a62bb1d3aa031fe60934ea021b34cf  
Author: Ruicong Xie [rx2119@columbia.edu](mailto:rx2119@columbia.edu)  
Date: Sat Apr 2 00:18:16 2016 -0400

the semicolon version of with

src/parser.mly | 2 +-  
src/tests/test-with1.eq | 2 +-  
2 files changed, 2 insertions(+), 2 deletions(-)

commit b8addb167ff02e825f91a2e4c8f05c359f048c8a  
Author: Jonathan Zacsh [jzacsh@gmail.com](mailto:jzacsh@gmail.com)  
Date: Fri Apr 1 23:57:10 2016 -0400

massively simplify regex for number grammar

likely matches many less strings accidentally matched, but still passes tests setup by pull #40

src/scanner.mll | 17 ++++++-----  
1 file changed, 9 insertions(+), 8 deletions(-)

commit af33a2684147782e972aac763b03922f6186d16b  
Author: Jonathan Zacsh [jzacsh@gmail.com](mailto:jzacsh@gmail.com)  
Date: Fri Apr 1 23:54:17 2016 -0400

noop(readability) indent grammar rules same column

src/scanner.mll | 68 ++++++-----  
1 file changed, 34 insertions(+), 34 deletions(-)

commit fb3d8b5e8e936ba4b38940b486714f2a50842148  
Author: Jonathan Zacsh [jzacsh@gmail.com](mailto:jzacsh@gmail.com)  
Date: Fri Apr 1 22:54:45 2016 -0400

noop(readability) use variable name "whitespace"  
(rather than extra comment for it)

src/scanner.mll | 6 ++++--  
1 file changed, 4 insertions(+), 2 deletions(-)

commit e0482547e3bade0c94d5d15184817812f50b82f5  
Author: Jonathan Zacsh [jzacsh@gmail.com](mailto:jzacsh@gmail.com)  
Date: Fri Apr 1 22:43:57 2016 -0400

noop(readability) clarify what "context" is here

src/scanner.mll | 4 ++--  
1 file changed, 2 insertions(+), 2 deletions(-)

commit 3c4d87bfd35c682c4ca2f68b19530ed2a2c6e8f3  
Author: Jonathan Zacsh [jzacsh@gmail.com](mailto:jzacsh@gmail.com)  
Date: Fri Apr 1 22:42:26 2016 -0400

noop(readability) `dig` to DRY `let` regexps

src/scanner.mll | 18 ++++++-----  
1 file changed, 11 insertions(+), 7 deletions(-)

commit 21a473cc2bee860f811ccbfd3242674a397c0e0  
Author: Ruicong Xie [rx2119@columbia.edu](mailto:rx2119@columbia.edu)  
Date: Fri Apr 1 22:40:32 2016 -0400

with keyboard in progress

src/debugtokens.ml | 1 +  
src/parser.mly | 8 ++++----  
2 files changed, 5 insertions(+), 4 deletions(-)

commit 728876770fb934be56aa91e3d0b82f2353cdc26a  
Author: kekeleila [lh2756@barnard.edu](mailto:lh2756@barnard.edu)  
Date: Fri Apr 1 21:10:11 2016 -0400

add test for while loop, test pass

src/tests/test-while.eq | 9 ++++++++  
src/tests/test-while.out | 2 ++  
2 files changed, 11 insertions(+)

commit 49eaab885f09283dcd6ae4a72f3a879112a72cb  
Author: Tianci Zhong [tz2278@columbia.edu](mailto:tz2278@columbia.edu)  
Date: Fri Apr 1 20:43:26 2016 -0400

create new temporary test for print find seperately

src/tests/test-print-findseperate.eq | 7 ++++++  
src/tests/test-print-findseperate.out | 1 +  
2 files changed, 8 insertions(+)

commit 0b37a6942767d557849c69c54c061e7c0523ba96  
Author: Ruicong Xie [rx2119@columbia.edu](mailto:rx2119@columbia.edu)  
Date: Fri Apr 1 20:38:36 2016 -0400

simplified number regex

src/scanner.mll | 11 ++++++-----  
1 file changed, 6 insertions(+), 5 deletions(-)

commit 5f9cc5461f5305e974c0bb9b1746c319b01a96d8  
Author: Ruicong Xie [rx2119@columbia.edu](mailto:rx2119@columbia.edu)  
Date: Fri Apr 1 20:22:20 2016 -0400

changed floating point regex to a single line expression

src/scanner.mll | 8 +++++-----  
1 file changed, 4 insertions(+), 4 deletions(-)

commit a382a9d3d7dee785c81bc1413619c27a0f9ab81b  
Author: Nam Hoang [nh2110@columbia.edu](mailto:nh2110@columbia.edu)  
Date: Fri Apr 1 19:45:17 2016 -0400

create empty maps for the value of ctxmap

src/semant.ml | 18 ++++++++-----  
1 file changed, 12 insertions(+), 6 deletions(-)

commit 657aff416308749149d9faa7b496568a22ca4cd9  
Author: Nam Hoang [nh2110@columbia.edu](mailto:nh2110@columbia.edu)  
Date: Fri Apr 1 19:31:10 2016 -0400

add dummy function for ctxmap

src/semant.ml | 12 ++++++++-----  
1 file changed, 11 insertions(+), 1 deletion(-)

commit a04f5a758839bec17387165290db263d8d7839d0  
Author: Nam Hoang [nh2110@columbia.edu](mailto:nh2110@columbia.edu)  
Date: Fri Apr 1 19:17:57 2016 -0400

change the structure of eqeq so that takes in the output of

src/eqeq.ml | 4 ++-  
src/semant.ml | 3 ++-  
2 files changed, 4 insertions(+), 3 deletions(-)

commit 56c345452c5978e87db13a96b5e128d3258ce075  
Author: Ruicong Xie [rx2119@columbia.edu](mailto:rx2119@columbia.edu)  
Date: Fri Apr 1 19:17:50 2016 -0400

deleted original files

src/tests/test-int-float.eq | 20 -----  
src/tests/test-int-float.out | 7 -----  
2 files changed, 27 deletions(-)

commit a94643b7ab290678f0c9888203ab2a3e4b56b7a5  
Author: Ruicong Xie [rx2119@columbia.edu](mailto:rx2119@columbia.edu)  
Date: Fri Apr 1 19:16:45 2016 -0400

renamed test-int-double to test-number

src/tests/test-number.eq | 20 ++++++  
src/tests/test-number.out | 7 ++++++  
2 files changed, 27 insertions(+)

commit 6dd8bad97fb34f761782fb52271cea0f6883aa9b  
Author: Ruicong Xie [rx2119@columbia.edu](mailto:rx2119@columbia.edu)  
Date: Fri Apr 1 19:07:58 2016 -0400

simplified regex for int and float

src/scanner.mll | 16 +++++-----  
1 file changed, 5 insertions(+), 11 deletions(-)

commit 1a37e67cbc47df8a7be6e1ff8a0223aaa5c6a8f0  
Author: Ruicong Xie [rx2119@columbia.edu](mailto:rx2119@columbia.edu)  
Date: Fri Apr 1 18:42:09 2016 -0400

added more test cases including negative numbes

src/tests/test-int-float.eq | 4 ++++  
src/tests/test-int-float.out | 2 ++  
2 files changed, 6 insertions(+)

commit bbbe146ae5b59a3008f64ccba8bbea2e80f1cd68  
Author: Ruicong Xie [rx2119@columbia.edu](mailto:rx2119@columbia.edu)  
Date: Fri Apr 1 18:37:30 2016 -0400

added e expression to int and float

src/scanner.mll | 12 ++++++-----  
1 file changed, 11 insertions(+), 1 deletion(-)

commit 7dd049d052ef2eb916fb53f567fd1f6321f2c9c4

Author: Nam Hoang [nnh2110@columbia.edu](mailto:nnh2110@columbia.edu)  
Date: Fri Apr 1 17:09:00 2016 -0400

change test name to a more correct one

src/tests/test-multiple-vars-one-ctx.eq | 8 -----  
src/tests/test-multiple-vars-one-ctx.out | 1 -  
src/tests/test-var-appear-multiple-times.eq | 8 ++++++++  
src/tests/test-var-appear-multiple-times.out | 1 +  
4 files changed, 9 insertions(+), 9 deletions(-)

commit 195027f33d7335a0661769d49490da0a374734ad  
Author: Nam Hoang [nnh2110@columbia.edu](mailto:nnh2110@columbia.edu)  
Date: Fri Apr 1 17:03:23 2016 -0400

add test for multiple variables

src/tests/test-multiple-vars-one-ctx.eq | 8 ++++++++  
src/tests/test-multiple-vars-one-ctx.out | 1 +  
2 files changed, 9 insertions(+)

commit bfc8be4a21931628d76c8228eeb728a13b1b719e  
Author: Tianci Zhong [tz2278@columbia.edu](mailto:tz2278@columbia.edu)  
Date: Fri Apr 1 18:18:23 2016 -0400

update test-absolute with more intermediate steps

src/tests/test-absolutevalue.eq | 2 ++  
src/tests/test-absolutevalue.out | 2 ++  
2 files changed, 4 insertions(+)

commit ce7b1a739b345690f4e13f4af6cfe445274210ba  
Author: Nam Hoang [nnh2110@columbia.edu](mailto:nnh2110@columbia.edu)  
Date: Fri Apr 1 17:02:13 2016 -0400

change variable names for readability

src/semant.ml | 14 ++++++-----  
1 file changed, 7 insertions(+), 7 deletions(-)

commit 7795af99c342c5b790a99da10acdeb7fed560c07  
Author: Ruicong Xie [rx2119@columbia.edu](mailto:rx2119@columbia.edu)  
Date: Fri Apr 1 17:57:39 2016 -0400

added test files for improved int float

src/tests/test-int-float.eq | 16 ++++++  
src/tests/test-int-float.out | 5 +++++  
2 files changed, 21 insertions(+)

commit 5853e05614a963abdb55c7bedba11a3b96bd63f8  
Author: Tianci Zhong [tz2278@columbia.edu](mailto:tz2278@columbia.edu)  
Date: Fri Apr 1 17:51:33 2016 -0400

add absolute value and modified test-poe test-absolute



src/codegen.ml | 2 +-  
src/debugtokens.ml | 3 +++  
src/parser.mly | 2 +-  
src/tests/test-absolutevalue.eq | 4 +++-  
src/tests/test-absolutevalue.out | 4 +++-  
src/tests/test-pow.eq | 5 +++--  
src/tests/test-pow.out | 1 +  
7 files changed, 15 insertions(+), 6 deletions(-)

commit e49e4ad06d2e013336386b5651eb90b182592554  
Author: Ruicong Xie [rx2119@columbia.edu](mailto:rx2119@columbia.edu)  
Date: Fri Apr 1 16:21:43 2016 -0400

add new syntax 'WITH expr' and 'find ID WITH', (WITH) expr will always be on top of stmt list

src/parser.mly | 11 ++++++-----  
1 file changed, 6 insertions(+), 5 deletions(-)

commit 59ca2860879621dc47d1b50c8ec2a1423b772bed  
Author: Ruicong Xie [rx2119@columbia.edu](mailto:rx2119@columbia.edu)  
Date: Fri Apr 1 16:19:40 2016 -0400

added keyboard WITH to scanner

src/scanner.mll | 1 +  
1 file changed, 1 insertion(+)

commit eadb206a55f7a06daf5839855d7f999e24d51f84  
Author: Ruicong Xie [rx2119@columbia.edu](mailto:rx2119@columbia.edu)  
Date: Fri Apr 1 15:47:35 2016 -0400

added with but need to change it to better syntax later

src/parser.mly | 8 ++++++++  
1 file changed, 8 insertions(+)

commit 83b9f9624e19272f4c8cae4f14ecf3c362bbddf1  
Author: Ruicong Xie [rx2119@columbia.edu](mailto:rx2119@columbia.edu)  
Date: Fri Apr 1 15:39:55 2016 -0400

added with test, currently it will fail

src/tests/test-with1.eq | 9 ++++++++  
src/tests/test-with1.out | 2 ++  
2 files changed, 11 insertions(+)

commit 5f7247b00ca151377384111490c416f8f9a6d270  
Author: Jonathan Zacsh [jzacsh@gmail.com](mailto:jzacsh@gmail.com)  
Date: Fri Apr 1 15:12:58 2016 -0400

lint coverage for outdated debug-tokens

src/bin/lint.sh | 9 ++++++++  
1 file changed, 9 insertions(+)

commit 935d618220163c38badc1ddfdc5b8d61ffe2190

Author: Ruicong Xie [rx2119@columbia.edu](mailto:rx2119@columbia.edu)  
Date: Fri Apr 1 14:54:23 2016 -0400

updated mod and pow in debugtokens.ml

src/debugtokens.ml | 2 ++  
1 file changed, 2 insertions(+)

commit c2e262750481f7692dc0f2b4205efb4acb21ec96  
Author: Jonathan Zacsh [jzacsh@gmail.com](mailto:jzacsh@gmail.com)  
Date: Thu Mar 31 23:30:05 2016 -0400

test(ubernitpicking) pad test no.s; columnar print

src/bin/e2e-tests.sh | 6 +++---  
1 file changed, 3 insertions(+), 3 deletions(-)

commit dc7afbb800d84a9ebc770c6768e6f9ba6c788354  
Author: kekeleila [lh2756@barnard.edu](mailto:lh2756@barnard.edu)  
Date: Thu Mar 31 22:52:21 2016 -0400

change the name of test-if1.eq to test-if.eq

src/tests/test-if.eq | 11 ++++++++  
src/tests/test-if.out | 2 ++  
src/tests/test-if1.eq | 11 -----  
src/tests/test-if1.out | 2 --  
4 files changed, 13 insertions(+), 13 deletions(-)

commit b2b35aaa073c8d4a6ab70be1cada40677dee1fcd  
Author: Jonathan Zacsh [jzacsh@gmail.com](mailto:jzacsh@gmail.com)  
Date: Thu Mar 31 22:13:05 2016 -0400

tdd: add "scri[p]table" flag & use for `make lint`

src/bin/e2e-tests.sh | 29 ++++++++-----  
src/bin/lint.sh | 10 +++-----  
2 files changed, 24 insertions(+), 15 deletions(-)

commit 0a4c7437575b66daa011ee37a25967a4bf6971f1  
Author: Jonathan Zacsh [jzacsh@gmail.com](mailto:jzacsh@gmail.com)  
Date: Thu Mar 31 22:12:39 2016 -0400

tdd fix "col" output on OSX in script

src/bin/e2e-tests.sh | 3 +-  
1 file changed, 2 insertions(+), 1 deletion(-)

commit da12975b487536416ea67ed4e6b1802fe93f4ee2  
Author: kekeleila [lh2756@barnard.edu](mailto:lh2756@barnard.edu)  
Date: Thu Mar 31 21:00:49 2016 -0400

commit test-mod.eq test-mod.out test-pow.eq

src/tests/test-helloworld-double.eq | 7 -----

src/tests/test-if.eq | 14 -----  
src/tests/test-mod.eq | 2 +-  
src/tests/test-mod.out | 2 +-  
src/tests/test-operator.eq | 14 -----  
src/tests/test-pow.eq | 3 +-  
6 files changed, 4 insertions(+), 38 deletions(-)

commit 2cff36d9f8838970305d7066ae42bc965a16d07d  
Author: Jonathan Zacsh [jzacsh@gmail.com](mailto:jzacsh@gmail.com)  
Date: Thu Mar 31 20:33:34 2016 -0400

``doctoc --notitle` for quicklinks`

src/README.md | 9 +++++++-  
1 file changed, 8 insertions(+), 1 deletion(-)

commit 21db9b81ffeb89b31ab68de27a0aa8b550f179bd  
Author: Jonathan Zacsh [jzacsh@gmail.com](mailto:jzacsh@gmail.com)  
Date: Thu Mar 31 19:49:15 2016 -0400

`doc: fix github flavor markdown`

src/CONTRIBUTING.md | 12 ++++++-----  
1 file changed, 7 insertions(+), 5 deletions(-)

commit a77d1955109dd6881216ba0668a7f7580452b6c8  
Author: Jonathan Zacsh [jzacsh@gmail.com](mailto:jzacsh@gmail.com)  
Date: Thu Mar 31 19:42:37 2016 -0400

`doc: simplify "how to code" doc: de-duping 2 lists`

src/CONTRIBUTING.md | 44 ++++++-----  
1 file changed, 17 insertions(+), 27 deletions(-)

commit 5bacc9c61b9ac85844de4d5090ca51a203a34e35  
Author: Jonathan Zacsh [jzacsh@gmail.com](mailto:jzacsh@gmail.com)  
Date: Thu Mar 31 19:22:40 2016 -0400

`doc link to "Writing Tests" to avoid confusion`

src/README.md | 2 +-  
1 file changed, 1 insertion(+), 1 deletion(-)

commit 1d86a21ede191b46931b07aaca3e5a4a9f3372b1  
Author: Jonathan Zacsh [jzacsh@gmail.com](mailto:jzacsh@gmail.com)  
Date: Thu Mar 31 19:20:26 2016 -0400

`doc: some debugging tips to always start with`

src/CONTRIBUTING.md | 10 ++++++  
1 file changed, 10 insertions(+)

commit 67d4902c02aa699072da519357c80a74687b2a6e  
Author: Jonathan Zacsh [jzacsh@gmail.com](mailto:jzacsh@gmail.com)  
Date: Thu Mar 31 18:34:08 2016 -0400

OSX bug: `tail` does not have --lines option

src/bin/lint.sh | 2 +-  
1 file changed, 1 insertion(+), 1 deletion(-)

commit 7312f126d84ce3b005f40494c05f78304678331d  
Author: kekeleila [lh2756@barnard.edu](mailto:lh2756@barnard.edu)  
Date: Thu Mar 31 17:27:27 2016 -0400

remove not working test files

src/tests/test-plus.eq | 7 +-----  
1 file changed, 1 insertion(+), 6 deletions(-)

commit 986ab117c855514df7e39811b89b9ca6cfe36b20  
Author: kekeleila [lh2756@barnard.edu](mailto:lh2756@barnard.edu)  
Date: Thu Mar 31 17:24:06 2016 -0400

remove test-operator.eq file, because unable to reassign value to variable.the operator itself pass

src/tests/test-plus.eq | 14 ++++++  
src/tests/test-plus.out | 1 +  
2 files changed, 15 insertions(+)

commit cbe26b8d3f717305d0ac6bfc4dc2e5f3fa42b781  
Author: kekeleila [lh2756@barnard.edu](mailto:lh2756@barnard.edu)  
Date: Thu Mar 31 17:16:25 2016 -0400

add test-if1.out file and update test-if1.eq file

src/tests/test-if1.eq | 14 ++++++----  
src/tests/test-if1.out | 2 ++  
2 files changed, 12 insertions(+), 4 deletions(-)

commit 1d436eb8dc8b2fbb0ad7b3b2a9d609175a3908dc  
Author: Jonathan Zacsh [jzacsh@gmail.com](mailto:jzacsh@gmail.com)  
Date: Thu Mar 31 17:06:10 2016 -0400

Doc: clarify the purpose of pull-requests

src/CONTRIBUTING.md | 3 +++  
1 file changed, 3 insertions(+)

commit 8d585f55b2051d9e8b4fed1fcfeedd5aeb5ed53  
Author: Tianci Zhong [tz2278@columbia.edu](mailto:tz2278@columbia.edu)  
Date: Thu Mar 31 16:35:26 2016 -0400

add abs and test

src/ast.ml | 3 +-  
src/codegen.ml | 5 ++++  
src/parser.mly | 8 +++++--  
src/scanner.mll | 1 +  
src/tests/test-absolutevalue.eq | 6 ++++++  
src/tests/test-absolutevalue.out | 1 +

6 files changed, 19 insertions(+), 5 deletions(-)

commit 1de7241f30e10587b446d19dc2b07de9103ed89b  
Author: Jonathan Zacsh [jzacsh@gmail.com](mailto:jzacsh@gmail.com)  
Date: Thu Mar 31 16:04:32 2016 -0400

shrink "Code in Branches" doc, simplify steps

src/CONTRIBUTING.md | 27 ++++++-----  
1 file changed, 13 insertions(+), 14 deletions(-)

commit dc96c945fbc4fcde7b454710f7a4046a46b3a66  
Author: Jonathan Zacsh [jzacsh@gmail.com](mailto:jzacsh@gmail.com)  
Date: Thu Mar 31 15:39:38 2016 -0400

doc: more high-level "howto git" based on feedback

src/CONTRIBUTING.md | 18 ++++++-----  
1 file changed, 17 insertions(+), 1 deletion(-)

commit 71de82976622811f7d86c7e4e6b03fbde7d232c  
Author: Jonathan Zacsh [jzacsh@gmail.com](mailto:jzacsh@gmail.com)  
Date: Thu Mar 31 15:16:58 2016 -0400

default to -lm on tail-end of C-compiler args

-lm (Link "math" lib, I believe). see <http://stackoverflow.com/a/11336610/287374>  
Should be a good default since we most always will have something from `math.h`  
in our compiler's output.

src/bin/e2e-tests.sh | 3 +-  
src/bin/eq-to-obj.sh | 18 ++++++-----  
2 files changed, 20 insertions(+), 1 deletion(-)

commit 1b852b237047823dc710a9022e7f855a708d0501  
Author: Jonathan Zacsh [jzacsh@gmail.com](mailto:jzacsh@gmail.com)  
Date: Thu Mar 31 15:06:09 2016 -0400

noop: move scripts to bin/ dir

(since i'm about to add yet another script)

src/Makefile | 9 +-  
src/acceptance\_test.py | 31 ----  
src/bin/acceptance\_test.py | 31 +++++  
src/bin/e2e-tests.sh | 323 ++++++-----  
src/bin/lint.sh | 52 ++++++  
src/e2e-tests.sh | 323 -----  
src/lint.sh | 52 -----  
7 files changed, 411 insertions(+), 410 deletions(-)

commit acb424afc53657ddc9f09a65fe9279687fc91e0b  
Author: Jonathan Zacsh [jzacsh@gmail.com](mailto:jzacsh@gmail.com)  
Date: Thu Mar 31 14:16:56 2016 -0400

fix link to src/ readme

src/CONTRIBUTING.md | 2 +-  
1 file changed, 1 insertion(+), 1 deletion(-)

commit 8b0a6551565e19067de41537d6d474932717388b  
Author: Jonathan Zacsh [jzacsh@gmail.com](mailto:jzacsh@gmail.com)  
Date: Thu Mar 31 14:16:47 2016 -0400

fix broken github markdown

src/README.md | 3 +--  
1 file changed, 1 insertion(+), 2 deletions(-)

commit ea7d7e183ed8c918e270a9e5f4adcd697f20da78  
Author: Jonathan Zacsh [jzacsh@gmail.com](mailto:jzacsh@gmail.com)  
Date: Thu Mar 31 14:14:44 2016 -0400

move howto-code into CONTRIBUTING doc

src/CONTRIBUTING.md | 52 +++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++  
src/README.md | 60 +------  
2 files changed, 54 insertions(+), 58 deletions(-)

commit 5e9fe0b1f4439016fd4fc2d67a6d0c384538ec17  
Author: Jonathan Zacsh [jzacsh@gmail.com](mailto:jzacsh@gmail.com)  
Date: Thu Mar 31 14:10:56 2016 -0400

doc a bit too long, give more important points

src/README.md | 2 ++  
1 file changed, 2 insertions(+)

commit 3e0b137f0914d2b795eccdc986eb438c2a4878044  
Author: Jonathan Zacsh [jzacsh@gmail.com](mailto:jzacsh@gmail.com)  
Date: Thu Mar 31 14:09:29 2016 -0400

doc(HUGE) ensure people look at their diffs!

src/README.md | 1 +  
1 file changed, 1 insertion(+)

commit bb104ffae5a8cc0cb0a745ce1d4a526d84b80886  
Author: Jonathan Zacsh [jzacsh@gmail.com](mailto:jzacsh@gmail.com)  
Date: Thu Mar 31 14:08:36 2016 -0400

doc: strip unnecessary list-ordering on sub-list

src/README.md | 14 ++++++-----  
1 file changed, 7 insertions(+), 7 deletions(-)

commit 2660a604f7161602047705762f55b7924fb0ab5b  
Author: Jonathan Zacsh [jzacsh@gmail.com](mailto:jzacsh@gmail.com)  
Date: Thu Mar 31 14:05:33 2016 -0400

fix github flavored md; need \n before lists

src/README.md | 7 ++++-  
1 file changed, 5 insertions(+), 2 deletions(-)

commit b8a0abcc6014ea4c8f889c34fc1abb7a660bedda  
Author: Jonathan Zacsh [jzacsh@gmail.com](mailto:jzacsh@gmail.com)  
Date: Thu Mar 31 14:00:02 2016 -0400

```
doc: git branch forked, and pulled back to fork
(adds specific username to follow examples)
```

src/README.md | 18 ++++++-----  
1 file changed, 15 insertions(+), 3 deletions(-)

commit 8d5e8b18c8916ede7644b2743705a9e3f685b1c7  
Author: Jonathan Zacsh [jzacsh@gmail.com](mailto:jzacsh@gmail.com)  
Date: Thu Mar 31 13:51:17 2016 -0400

```
document git-confusion about sharing work
```

src/README.md | 12 ++++++  
1 file changed, 12 insertions(+)

commit 1b3b9c4d4c962a13731aabc7f9efc09d1ee87194  
Author: Jonathan Zacsh [jzacsh@gmail.com](mailto:jzacsh@gmail.com)  
Date: Thu Mar 31 13:43:16 2016 -0400

```
document dev workflow to settle ongoing confusion
```

src/README.md | 73 ++++++-----  
1 file changed, 54 insertions(+), 19 deletions(-)

commit 4c3baf3891c6fd262230dda5d4c26deb49938622  
Author: Jonathan Zacsh [jzacsh@gmail.com](mailto:jzacsh@gmail.com)  
Date: Thu Mar 31 13:00:05 2016 -0400

```
noop: wrap prose at 80 chars
```

src/README.md | 12 ++++++---  
1 file changed, 9 insertions(+), 3 deletions(-)

commit 9e08402b8f167bcdee8ce93dc3690cfb971e2d17  
Author: Jimmy Xie [rxie25@gmail.com](mailto:rxie25@gmail.com)  
Date: Thu Mar 31 11:31:47 2016 -0400

```
changed python script name and description
```

src/acceptance\_test.py | 31 -----  
src/debug\_frontend.py | 31 ++++++-----  
2 files changed, 31 insertions(+), 31 deletions(-)

commit e323e64b04f88551a5fda0db5eb033aaf53b5d46  
Author: Tianci Zhong [tz2278@columbia.edu](mailto:tz2278@columbia.edu)  
Date: Thu Mar 31 05:13:48 2016 -0400

delete empty test

src/tests/test-helloworld-double.eq | 0  
src/tests/test-helloworld.eq | 0  
2 files changed, 0 insertions(+), 0 deletions(-)

commit 4c0ab6ab6e89253b92c0562c4076f71eae26aaac  
Author: Tianci Zhong [tz2278@columbia.edu](mailto:tz2278@columbia.edu)  
Date: Thu Mar 31 05:02:07 2016 -0400

fix mod and add pow used math.h for them

src/ast.ml | 3 ++-  
src/codegen.ml | 9 ++++++---  
src/parser.mly | 7 +++++---  
src/scanner.mll | 1 +  
src/tests/test-mod.eq | 8 ++++++++  
src/tests/test-mod.out | 1 +  
src/tests/test-pow.eq | 8 ++++++++  
src/tests/test-pow.out | 1 +  
8 files changed, 31 insertions(+), 7 deletions(-)

commit 10deb57138ca39f169e484bbef5a5931378b1155  
Author: Tianci Zhong [tz2278@columbia.edu](mailto:tz2278@columbia.edu)  
Date: Thu Mar 31 03:36:33 2016 -0400

edit mod

src/ast.ml | 3 ++-  
src/parser.mly | 5 +++--  
src/scanner.mll | 1 +  
3 files changed, 6 insertions(+), 3 deletions(-)

commit 61ae73201c29cdce3ed42687e83bed4dad81e882  
Author: Jonathan Zacsh [jzacsh@gmail.com](mailto:jzacsh@gmail.com)  
Date: Thu Mar 31 01:55:13 2016 -0400

doc: clarify 2 major/high-level issues remaining

src/README.md | 2 +-  
1 file changed, 1 insertion(+), 1 deletion(-)

commit f849e793bee14e013a89c5ed04226e6c68bf853d  
Author: Jonathan Zacsh [jzacsh@gmail.com](mailto:jzacsh@gmail.com)  
Date: Thu Mar 31 01:36:23 2016 -0400

tdd: \*fail\* half-written tests

src/e2e-tests.sh | 4 +++-  
1 file changed, 3 insertions(+), 1 deletion(-)

commit a18d050bee3c4965d9fc9b7726d7ad046c11f273  
Author: Jonathan Zacsh [jzacsh@gmail.com](mailto:jzacsh@gmail.com)  
Date: Thu Mar 31 01:21:12 2016 -0400

GH-#27: Revert "Merge pull request #25 from rxie25/tianci-mod"



This reverts commit 0c1968b58f4288d202d45a13faf5cd4001e46f5c, reversing changes made to 5a53e9a104795e0ea80c7f7ef3d2e6fb0f3f35ac.

src/ast.ml | 3 +--  
src/parser.mly | 3 +--  
src/scanner.mll | 1 -  
src/tests/test-mod.out | 1 -  
src/tests/test-mod.skip.eq | 9 -----  
5 files changed, 2 insertions(+), 15 deletions(-)

commit 6839b146256f698b57aa4a33b1986652483085b0  
Author: Jonathan Zacsh [jzacsh@gmail.com](mailto:jzacsh@gmail.com)  
Date: Wed Mar 30 23:58:24 2016 -0400

```
tdd: new `e2e` target including `lint`[1]
[1] **and** `lint` new checks for {shift,reduce}/reduce errors
```

.travis.yml | 3 +--  
src/Makefile | 4 +++-  
src/lint.sh | 8 ++++++-  
3 files changed, 11 insertions(+), 4 deletions(-)

commit 5553bf2c3f8687b91b67fdd5b3ed1c796e063036  
Author: kekeleila [lh2756@barnard.edu](mailto:lh2756@barnard.edu)  
Date: Wed Mar 30 22:50:37 2016 -0400

```
Delete test-plus.eq
Duplicate test file as test-operator.eq
```

src/tests/test-plus.eq | 8 -----  
1 file changed, 8 deletions(-)

commit da64a39251c5b1c6330b22a7eb42a25db1072cce  
Author: kekeleila [lh2756@barnard.edu](mailto:lh2756@barnard.edu)  
Date: Wed Mar 30 22:27:04 2016 -0400

```
update parser.mly, ast.ml to accept if statements, pass test test-if.eq
```

src/ast.ml | 4 ++--  
src/parser.mly | 4 ++--  
src/tests/test-if.eq | 6 +++++-  
3 files changed, 9 insertions(+), 5 deletions(-)

commit 26ef1c9ed2f38b09ddeb7f09815dad70ca62112  
Author: Jonathan Zacsh [jzacsh@gmail.com](mailto:jzacsh@gmail.com)  
Date: Wed Mar 30 21:09:57 2016 -0400

```
Fix outdated bits of dev readme
```

src/README.md | 6 +++---  
1 file changed, 3 insertions(+), 3 deletions(-)

commit 9b9878cf4ef112ad4ce4668369fe0691aa3ac716  
Author: Tianci Zhong [tz2278@columbia.edu](mailto:tz2278@columbia.edu)  
Date: Wed Mar 30 20:54:49 2016 -0400

change the hello world link

src/README.md | 2 +-  
1 file changed, 1 insertion(+), 1 deletion(-)

commit 8eda64a4a0cdc726bc5b5d6289a904b856c202f1  
Author: Tianci Zhong [tz2278@columbia.edu](mailto:tz2278@columbia.edu)  
Date: Wed Mar 30 20:43:56 2016 -0400

skip mod test

src/tests/test-mod.eq | 9 -----  
src/tests/test-mod.skip.eq | 9 ++++++++  
2 files changed, 9 insertions(+), 9 deletions(-)

commit 5a53e9a104795e0ea80c7f7ef3d2e6fb0f3f35ac  
Author: Jonathan Zacsh [jzacsh@gmail.com](mailto:jzacsh@gmail.com)  
Date: Wed Mar 30 20:37:59 2016 -0400

fix broken github flavor md check-list in README

src/README.md | 14 ++++++-----  
1 file changed, 8 insertions(+), 6 deletions(-)

commit 18b8664fe9081a47055285c2e4c2897f51fd1e6f  
Author: Jonathan Zacsh [jzacsh@gmail.com](mailto:jzacsh@gmail.com)  
Date: Wed Mar 30 20:34:40 2016 -0400

update readme to reflect latest high-level efforts/TODOs

src/README.md | 8 +++++--  
1 file changed, 5 insertions(+), 3 deletions(-)

commit bce115791c56887e0918bd54ac65145902d070bf  
Author: Tianci Zhong [tz2278@columbia.edu](mailto:tz2278@columbia.edu)  
Date: Wed Mar 30 20:33:57 2016 -0400

add mod operator

src/ast.ml | 3 +-  
src/parser.mly | 3 +-  
src/scanner.mll | 1 +  
src/tests/test-mod.eq | 9 ++++++++  
src/tests/test-mod.out | 1 +  
5 files changed, 15 insertions(+), 2 deletions(-)

commit 6c9cb0a27ac916025196ca038ce2eed206f02f90  
Author: Jonathan Zacsh [jzacsh@gmail.com](mailto:jzacsh@gmail.com)  
Date: Wed Mar 30 20:21:09 2016 -0400

fix href typo in main readme; from fc730e73a2c1462

README.md | 2 +-  
1 file changed, 1 insertion(+), 1 deletion(-)

commit aef26b300669c595497f3bfed00fb455fb2372ad  
Author: kekeleila [lh2756@barnard.edu](mailto:lh2756@barnard.edu)  
Date: Wed Mar 30 20:18:48 2016 -0400

tests/test-if.eq

src/tests/test-if.eq | 10 ++++++++  
1 file changed, 10 insertions(+)

commit 0d38e3b94a1ccfa6817660addaacd7dcd8ef6da5  
Author: Jonathan Zacsh [jzacsh@gmail.com](mailto:jzacsh@gmail.com)  
Date: Wed Mar 30 20:17:28 2016 -0400

GH-#15: test coverage for min-viable codegen

Accidentally left out of existing commits on issue. Doh.

src/tests/fail-duplicate-contexts.eq | 11 ++++++++  
src/tests/fail-duplicate-contexts.err | 1 +  
src/tests/fail-find-unrecognized-context.eq | 7 ++++++  
src/tests/fail-find-unrecognized-context.err | 1 +  
4 files changed, 20 insertions(+)

commit d13b4b466c91aa3870c47759df3686c7ec16f243  
Author: Jonathan Zacsh [jzacsh@gmail.com](mailto:jzacsh@gmail.com)  
Date: Wed Mar 30 20:10:53 2016 -0400

tdd: setup fail-tests to work w/o microc :)

src/e2e-tests.sh | 11 ++++++--  
1 file changed, 9 insertions(+), 2 deletions(-)

commit 72acc613ac2435a6e38fb7eb2e2d4048c243a53f  
Author: kekeleila [lh2756@barnard.edu](mailto:lh2756@barnard.edu)  
Date: Wed Mar 30 20:05:48 2016 -0400

<commit all

src/ast.ml | 6 +++--  
src/parser.mly | 4 ++--  
src/tests/test-if1.eq | 5 +++++  
src/tests/test-plus.eq | 4 ++--  
4 files changed, 12 insertions(+), 7 deletions(-)

commit fc730e73a2c14626062a612bd9afd133dc671dc9  
Author: Jonathan Zacsh [jzacsh@gmail.com](mailto:jzacsh@gmail.com)  
Date: Wed Mar 30 19:43:24 2016 -0400

update main README to to yell at viewer, per nam's suggestion

README.md | 4 ++++  
1 file changed, 4 insertions(+)

commit d8ac011e07e3d84f2accaf51b218b5ccf9caafe4  
Author: Tianci Zhong [tz2278@columbia.edu](mailto:tz2278@columbia.edu)  
Date: Wed Mar 30 19:39:29 2016 -0400

delete mc test

```
src/tests/fail-assign1.err | 1 -
src/tests/fail-assign1.mc | 11 -----
src/tests/fail-assign2.err | 1 -
src/tests/fail-assign2.mc | 7 -----
src/tests/fail-assign3.err | 1 -
src/tests/fail-assign3.mc | 11 -----
src/tests/fail-dead1.err | 1 -
src/tests/fail-dead1.mc | 8 -----
src/tests/fail-dead2.err | 1 -
src/tests/fail-dead2.mc | 10 -----
src/tests/fail-expr1.err | 1 -
src/tests/fail-expr1.mc | 18 -----
src/tests/fail-expr2.err | 1 -
src/tests/fail-expr2.mc | 14 -----
src/tests/fail-for1.err | 1 -
src/tests/fail-for1.mc | 13 -----
src/tests/fail-for2.err | 1 -
src/tests/fail-for2.mc | 8 -----
src/tests/fail-for3.err | 1 -
src/tests/fail-for3.mc | 8 -----
src/tests/fail-for4.err | 1 -
src/tests/fail-for4.mc | 8 -----
src/tests/fail-for5.err | 1 -
src/tests/fail-for5.mc | 10 -----
src/tests/fail-func1.err | 1 -
src/tests/fail-func1.mc | 12 -----
src/tests/fail-func2.err | 1 -
src/tests/fail-func2.mc | 8 -----
src/tests/fail-func3.err | 1 -
src/tests/fail-func3.mc | 8 -----
src/tests/fail-func4.err | 1 -
src/tests/fail-func4.mc | 12 -----
src/tests/fail-func5.err | 1 -
src/tests/fail-func5.mc | 14 -----
src/tests/fail-func6.err | 1 -
src/tests/fail-func6.mc | 9 -----
src/tests/fail-func7.err | 1 -
src/tests/fail-func7.mc | 9 -----
src/tests/fail-func8.err | 1 -
src/tests/fail-func8.mc | 13 -----
src/tests/fail-func9.err | 1 -
src/tests/fail-func9.mc | 9 -----
src/tests/fail-global1.err | 1 -
src/tests/fail-global1.mc | 9 -----
src/tests/fail-global2.err | 1 -
src/tests/fail-global2.mc | 9 -----
src/tests/fail-if1.err | 1 -
src/tests/fail-if1.mc | 6 -----
src/tests/fail-if2.err | 1 -
src/tests/fail-if2.mc | 6 -----
src/tests/fail-if3.err | 1 -
src/tests/fail-if3.mc | 8 -----
src/tests/fail-nomain.err | 1 -
src/tests/fail-nomain.mc | 0
src/tests/fail-return1.err | 1 -
src/tests/fail-return1.mc | 4 ----
src/tests/fail-return2.err | 1 -
src/tests/fail-return2.mc | 10 -----
src/tests/fail-while1.err | 1 -
src/tests/fail-while1.mc | 13 -----
src/tests/fail-while2.err | 1 -
```

```
src/tests/fail-while2.mc | 13 -----
src/tests/test-add1.mc | 10 -----
src/tests/test-add1.out | 1 -
src/tests/test-arith1.mc | 5 ----
src/tests/test-arith1.out | 1 -
src/tests/test-arith2.mc | 5 ----
src/tests/test-arith2.out | 1 -
src/tests/test-arith3.mc | 13 -----
src/tests/test-arith3.out | 1 -
src/tests/test-fib.mc | 16 -----
src/tests/test-fib.out | 6 ----
src/tests/test-for1.mc | 9 -----
src/tests/test-for1.out | 6 ----
src/tests/test-for2.mc | 11 -----
src/tests/test-for2.out | 6 ----
src/tests/test-func1.mc | 12 -----
src/tests/test-func1.out | 1 -
src/tests/test-func2.mc | 18 -----
src/tests/test-func2.out | 1 -
src/tests/test-func3.mc | 13 -----
src/tests/test-func3.out | 4 ----
src/tests/test-func4.mc | 14 -----
src/tests/test-func4.out | 1 -
src/tests/test-func5.mc | 9 -----
src/tests/test-func5.out | 0
src/tests/test-func6.mc | 9 -----
src/tests/test-func6.out | 1 -
src/tests/test-func7.mc | 13 -----
src/tests/test-func7.out | 1 -
src/tests/test-func8.mc | 10 -----
src/tests/test-func8.out | 1 -
src/tests/test-gcd2.mc | 14 -----
src/tests/test-gcd2.out | 3 ---
src/tests/test-global1.mc | 30 -----
src/tests/test-global1.out | 4 ----
src/tests/test-global2.mc | 10 -----
src/tests/test-global2.out | 1 -
src/tests/test-global3.mc | 11 -----
src/tests/test-global3.out | 1 -
src/tests/test-if1.mc | 6 ----
src/tests/test-if1.out | 2 --
src/tests/test-if2.mc | 6 ----
src/tests/test-if2.out | 2 --
src/tests/test-if3.mc | 6 ----
src/tests/test-if3.out | 1 -
src/tests/test-if4.mc | 6 ----
src/tests/test-if4.out | 2 --
src/tests/test-if5.mc | 16 -----
src/tests/test-if5.out | 2 --
src/tests/test-local1.mc | 13 -----
src/tests/test-local1.out | 1 -
src/tests/test-local2.mc | 14 -----
src/tests/test-local2.out | 1 -
src/tests/test-ops1.mc | 28 -----
src/tests/test-ops1.out | 24 -----
src/tests/test-ops2.mc | 17 -----
src/tests/test-ops2.out | 14 -----
src/tests/test-var1.mc | 7 -----
src/tests/test-var1.out | 1 -
src/tests/test-var2.mc | 13 -----
src/tests/test-var2.out | 1 -
src/tests/test-while1.mc | 11 -----
src/tests/test-while1.out | 6 ----
src/tests/test-while2.mc | 16 -----
```

src/tests/test-while2.out | 1 -  
126 files changed, 819 deletions(-)

commit 2ff8fde404f269912858fdf89730ae3e0d73352  
Author: Ruicong Xie [rx2119@columbia.edu](mailto:rx2119@columbia.edu)  
Date: Wed Mar 30 19:16:22 2016 -0400

tdd: fix tests on osx: bad grep & sed class-match

src/e2e-tests.sh | 4 ++--  
1 file changed, 2 insertions(+), 2 deletions(-)

commit e10893446a326db1ad1c827939f890f40c392c43  
Author: kekeleila [lh2756@barnard.edu](mailto:lh2756@barnard.edu)  
Date: Wed Mar 30 19:11:31 2016 -0400

test operators, all passed, add mod & power

src/tests/test-operator.eq | 14 ++++++  
1 file changed, 14 insertions(+)

commit 359db483f8ed6beb8538c17b580287cc4c2d578d  
Author: kekeleila [lh2756@barnard.edu](mailto:lh2756@barnard.edu)  
Date: Wed Mar 30 18:57:51 2016 -0400

add jimmy's acceptance\_test.py

src/acceptance\_test.py | 31 ++++++  
1 file changed, 31 insertions(+)

commit 7e97afd2391af35ce2a46c297ea764b76194b0f3  
Author: kekeleila [lh2756@barnard.edu](mailto:lh2756@barnard.edu)  
Date: Wed Mar 30 18:47:27 2016 -0400

test '+'

src/tests/test-helloworld-double.eq | 2 +-  
src/tests/test-plus.eq | 8 ++++++  
2 files changed, 9 insertions(+), 1 deletion(-)

commit d26c20571770c468b7ff1b28b1537c794848a75f  
Author: Tianci Zhong [tz2278@columbia.edu](mailto:tz2278@columbia.edu)  
Date: Wed Mar 30 18:24:32 2016 -0400

change all funcdecl to multieq

src/ast.ml | 14 ++++++-----  
src/codegen.ml | 8 +++++-  
2 files changed, 11 insertions(+), 11 deletions(-)

commit 22156d1ce796d63dd20fdfea51308223a8dff58  
Author: Nam Hoang [nh2110@columbia.edu](mailto:nh2110@columbia.edu)  
Date: Wed Mar 30 18:07:09 2016 -0400

instruction for getting generated C code

src/README.md | 5 +++++  
1 file changed, 5 insertions(+)

commit 83ffdd5b1b8d524ab45cdb73d2c500d187b55cef  
Author: Jonathan Zacsh [jzacsh@gmail.com](mailto:jzacsh@gmail.com)  
Date: Wed Mar 30 17:53:44 2016 -0400

GH-#15: fix bug in c058c6fdf0 checking wrong field

Need to check a find declaration's \*context\* exist, not its target  
(target-checking comes in the well-beyond minviable version of semantic  
analysis).

Was beautifully caught by two tests:

...

Running 7 tests:

tests/test-print-basic.eq, tests/test-globalctx.skip.eq, tests/test-find-noargs.skip.eq, tests/test-arithmetic

```
[1] "test-print-basic" asserting target's behavior Fatal error: exception Failure("unrecognized context, "popula
 Result: FAIL
[2] WARNING 'test-globalctx' not implemented Result: SKIP
[3] WARNING 'test-find-noargs' not implemented Result: SKIP
[4] WARNING 'test-arithmetic-basic' not implemented Result: SKIP
[5] WARNING 'test-simple-equation' not implemented Result: SKIP
[6] "test-helloworld" asserting target's behavior Fatal error: exception Failure("unrecognized context, "a")
 Result: FAIL
[7] WARNING 'test-print-multi-find' not implemented Result: SKIP
```

Summary of 7 tests: 2 FAILED 5 SKIPPED 0 PASSED

...

src/semant.ml | 2 +-  
1 file changed, 1 insertion(+), 1 deletion(-)

commit 0b928206a0fd996cf8740675027bbaa6acdc06ff  
Author: Jonathan Zacsh [jzacsh@gmail.com](mailto:jzacsh@gmail.com)  
Date: Wed Mar 30 17:39:34 2016 -0400

TDD bug: exitcode non-zero on test failures

(refactor bug) was incorrectly causing travis-ci to report "passing"

src/e2e-tests.sh | 2 +-  
1 file changed, 1 insertion(+), 1 deletion(-)

commit 9893d6ac7509809a2b5c1870688b861c7d64fb53  
Author: Jonathan Zacsh [jzacsh@gmail.com](mailto:jzacsh@gmail.com)  
Date: Wed Mar 30 17:21:08 2016 -0400

GH-#15: compiling ocaml! distinct AST fields FTW!

src/ast.ml | 8 +++++---  
src/codegen.ml | 4 ++--  
src/parser.mly | 4 ++--  
src/semant.ml | 15 ++++++++-----  
4 files changed, 16 insertions(+), 15 deletions(-)

commit 07c79c400c3adc7a9a8a528b537cfcff8e2ee82e  
Author: kekeleila [lh2756@barnard.edu](mailto:lh2756@barnard.edu)  
Date: Wed Mar 30 16:54:25 2016 -0400

change scanner to accept 42/42./42.333

src/scanner.mll | 2 +-  
src/tests/test-helloworld-double.eq | 2 +-  
src/tests/test-helloworld.eq | 2 +-  
3 files changed, 3 insertions(+), 3 deletions(-)

commit 83781f73a40fb7d115f2909d3e47f1848cfc2ca  
Author: Jonathan Zacsh [jzacsh@gmail.com](mailto:jzacsh@gmail.com)  
Date: Wed Mar 30 16:52:09 2016 -0400

```
GH-#15: don't dump `ast.ml` into semant's scope

Currently stuck at the following on `make test`:
...
+ ocamlfind ocamlc -c -o semant.cmo semant.ml
File "semant.ml", line 72, characters 43-52:
Error: This expression has type A.func_decl list
 but an expression was expected of type A.stmt list
 Type A.func_decl = Ast.func_decl is not compatible with type
 A.stmt = Ast.stmt
Command exited with code 2.
Compilation unsuccessful after building 13 targets (0 cached) in 00:00:00.
...
```

src/semant.ml | 51 ++++++-----  
1 file changed, 24 insertions(+), 27 deletions(-)

commit 6a54ea79ea1224dbd341f365babd3e14cd6a0b10  
Author: kekeleila [lh2756@barnard.edu](mailto:lh2756@barnard.edu)  
Date: Wed Mar 30 16:44:51 2016 -0400

```
add test for double, change scanner to accept only double type
```

src/ast.ml | 4 +-  
src/codegen.ml | 2 +-  
src/parser.mly | 2 +-  
src/scanner.mll | 2 +-  
src/tests/test-helloworld-double.eq | 0  
src/tests/test-helloworld.eq | 0  
src/tests/test-helloworld-double.eq | 7 ++++++  
7 files changed, 12 insertions(+), 5 deletions(-)

commit 132542f2a187e0831469323db711b8445edfd56b  
Author: Jonathan Zacsh [jzacsh@gmail.com](mailto:jzacsh@gmail.com)  
Date: Wed Mar 30 14:47:20 2016 -0400

```
GH-#15: report_dup redundant w/map-builder logic
```

src/semant.ml | 19 +-----  
1 file changed, 1 insertion(+), 18 deletions(-)

commit 274a0f908ea8393d3fe160cd69528dd9b3451779  
Author: Jonathan Zacsh [jzacsh@gmail.com](mailto:jzacsh@gmail.com)  
Date: Wed Mar 30 13:39:33 2016 -0400

```
GH-#15: fix `check_find` ocaml syntax
```

src/semant.ml | 11 +++++-  
1 file changed, 6 insertions(+), 5 deletions(-)

commit b8712707e3c7e9676a9d55150d413ac6203ca2ac



Author: Jonathan Zacsh [jzacsh@gmail.com](mailto:jzacsh@gmail.com)  
Date: Wed Mar 30 13:39:07 2016 -0400

GH-#15: fix syntax errors check\_expr

src/semant.ml | 21 ++++++-----  
1 file changed, 11 insertions(+), 10 deletions(-)

commit 6c0f409a0fba63d0a62866cdc0237e14ab8d1e8a  
Author: Jonathan Zacsh [jzacsh@gmail.com](mailto:jzacsh@gmail.com)  
Date: Wed Mar 30 13:27:10 2016 -0400

rm another `Noexpr` followup to cbfe3119156096fe

src/codegen.ml | 1 -  
1 file changed, 1 deletion(-)

commit af135947f3d9bd850a5acd3a049659be47b9cce0  
Author: Jonathan Zacsh [jzacsh@gmail.com](mailto:jzacsh@gmail.com)  
Date: Wed Mar 30 13:21:43 2016 -0400

GH-#15(BROKEN): tackle TODO; 1st pass check-expr

src/semant.ml | 28 ++++++-----  
1 file changed, 11 insertions(+), 17 deletions(-)

commit 18573b4d2c8bbe3f02243f50429a57f31ad3cfb8  
Author: Jonathan Zacsh [jzacsh@gmail.com](mailto:jzacsh@gmail.com)  
Date: Wed Mar 30 13:21:16 2016 -0400

GH-#15: fix broken ocaml syntax

src/semant.ml | 3 +--  
1 file changed, 1 insertion(+), 2 deletions(-)

commit cbfe3119156096fe206925d6976311334d44f89b  
Author: Jonathan Zacsh [jzacsh@gmail.com](mailto:jzacsh@gmail.com)  
Date: Wed Mar 30 13:20:26 2016 -0400

bug: had syntx `noexpr` irrelevant to our language

src/ast.ml | 2 --  
1 file changed, 2 deletions(-)

commit 5be88532763754a6474a49fc74e7dad803fbb1b1  
Author: Jonathan Zacsh [jzacsh@gmail.com](mailto:jzacsh@gmail.com)  
Date: Wed Mar 30 12:56:56 2016 -0400

GH-#15(bug): accidentally smash 2 args into tuple

src/semant.ml | 2 +-  
1 file changed, 1 insertion(+), 1 deletion(-)

commit 9360679dcd3241fe2c5629b0758ccbf2a399854f

Author: Jonathan Zacsh [jzacsh@gmail.com](mailto:jzacsh@gmail.com)

Date: Wed Mar 30 00:35:30 2016 -0400

```
BROKEN(semant) rm microc & "type" from our grammar

- cleans up old microc logic i left behind in semantic analysis
- clarifies steps i'm trying to take in this phase
- removes "bool" and "double" type that somehow slipped back into our grammar...
- uncomments, leaving code in broken state (for transparency?);
 - Specifically: among other ocaml compilation errors that I've yet to grok:
```sh
File "semant.ml", line 49, characters 11-49:
Error: This expression has type
       Ast.ctx_decl StringMap.t = Ast.ctx_decl Map.Make(String).t
but an expression was expected of type
       'a -> Ast.ctx_decl StringMap.t * Ast.ctx_decl
Command exited with code 2.
Compilation unsuccessful after building 13 targets (0 cached) in 00:00:00.
```
```

src/ast.ml | 8 ---

src/semant.ml | 185 ++++++-----

2 files changed, 62 insertions(+), 131 deletions(-)

commit f40b010eefc816b6243b484b9236f7f657734d58

Author: Jonathan Zacsh [jzacsh@gmail.com](mailto:jzacsh@gmail.com)

Date: Tue Mar 29 15:16:38 2016 -0400

```
tdd: keep eye on skipped tests; stop skipping asap
```

src/lint.sh | 26 ++++++-----

1 file changed, 23 insertions(+), 3 deletions(-)

commit 101a5e518be28b861618d7f50b79b14f95c6cc24

Author: Jonathan Zacsh [jzacsh@gmail.com](mailto:jzacsh@gmail.com)

Date: Tue Mar 29 15:14:39 2016 -0400

```
ensure lint runs on continuous integration
```

.travis.yml | 1 +

1 file changed, 1 insertion(+)

commit 4ebc877b9b53abda399edb88a8644e9321eee93b

Author: Jonathan Zacsh [jzacsh@gmail.com](mailto:jzacsh@gmail.com)

Date: Tue Mar 29 14:37:21 2016 -0400

```
tdd nit: ensure `help` recognized backfill doc[1]
```

```
[1]: forgot to create complete usage-line w/"default" val
```

src/e2e-tests.sh | 7 +++++--

1 file changed, 5 insertions(+), 2 deletions(-)

commit 4d7a81e9b590272cd4ba66fec88e356f3e5fec2d

Author: Jonathan Zacsh [jzacsh@gmail.com](mailto:jzacsh@gmail.com)

Date: Tue Mar 29 14:31:06 2016 -0400

```
tdd: easily runs [-s]kipped tests w/o file renames
```

```
Run `make TEST_OPTS=-s test` to force skipped tests to run anyway.
`./e2e-tests.sh -h` for full list of such flags can pass to `make`
```

src/e2e-tests.sh | 27 ++++++-----  
1 file changed, 16 insertions(+), 11 deletions(-)

commit 21ae22d4dab7558548880b850954a1c96acc199b  
Author: Jonathan Zacsh [jzacsh@gmail.com](mailto:jzacsh@gmail.com)  
Date: Tue Mar 29 14:15:24 2016 -0400

tdd: fail *\*only\** due to outstanding arithmetic  
(currently was failing due to our outstanding GH-#7)

src/tests/test-arithmetic-basic.skip.eq | 2 +-  
1 file changed, 1 insertion(+), 1 deletion(-)

commit 72d7dcb0da59fc91559f1bd5fc6edadcad63255  
Author: Jonathan Zacsh [jzacsh@gmail.com](mailto:jzacsh@gmail.com)  
Date: Tue Mar 29 14:12:12 2016 -0400

tdd: covers basic arithmetic ops & precedence

src/tests/test-arithmetic-basic.out | 13 ++++++  
src/tests/test-arithmetic-basic.skip.eq | 29 ++++++  
2 files changed, 42 insertions(+)

commit 669813503d207a26558d015e8674359797f69b61  
Author: Jonathan Zacsh [jzacsh@gmail.com](mailto:jzacsh@gmail.com)  
Date: Tue Mar 29 13:53:31 2016 -0400

tdd coverage: allow for global-context reference  
that is: ``find`` expressions don't syntactically require a context (no context implies global variable access)

src/tests/test-globalctx.out | 1 +  
src/tests/test-globalctx.skip.eq | 6 +++++  
2 files changed, 7 insertions(+)

commit e02310e11490407fe09b9a58c15564a8759c0a3c  
Author: Jonathan Zacsh [jzacsh@gmail.com](mailto:jzacsh@gmail.com)  
Date: Tue Mar 29 13:52:24 2016 -0400

tdd coverage of no-argument ``find`` expressions  
example taken directly from [LRM's first code snippet] (<https://github.com/rxie25/PLT2016Spring/blob/master/notes/language-reference-manual.md#definition-of-a-prog>)

src/tests/test-find-noargs.out | 1 +  
src/tests/test-find-noargs.skip.eq | 3 +++  
2 files changed, 4 insertions(+)

commit 618a555d1d852287a03115bca9bc9e682eea971b  
Author: Jonathan Zacsh [jzacsh@gmail.com](mailto:jzacsh@gmail.com)  
Date: Tue Mar 29 13:22:50 2016 -0400

nit(testing) fix optional file-passing to script  
(also fixes incorrect test... even though it doesn't matter, since ``set -e`` doesn't seem to be respected for some reason...)

src/e2e-tests.sh | 4 ++--  
1 file changed, 2 insertions(+), 2 deletions(-)

commit b019cde212db0ca39cdfaed0d2d380f2cfe71bd8  
Author: Jonathan Zacsh [jzacsh@gmail.com](mailto:jzacsh@gmail.com)  
Date: Tue Mar 29 00:20:11 2016 -0400

noop(deadcode) testNum hack no longer used

src/e2e-tests.sh | 1 -  
1 file changed, 1 deletion(-)

commit 64de167eab6ddef37d0174d597982cd16e494ffb  
Author: Jonathan Zacsh [jzacsh@gmail.com](mailto:jzacsh@gmail.com)  
Date: Tue Mar 29 00:03:51 2016 -0400

GH-#7: skip failing test (mistakenly left enabled)

commit 91cfa9119a1773976c4d5 accidentally left this test enabled; intended to  
commit it as an example on how to skip. skipping now.

src/tests/test-simple-equation.eq | 7 -----  
src/tests/test-simple-equation.skip.eq | 7 +++++++  
2 files changed, 7 insertions(+), 7 deletions(-)

commit 6a83899b5cfd0fbdece484ab5c255595d8dde9d4  
Author: Jonathan Zacsh [jzacsh@gmail.com](mailto:jzacsh@gmail.com)  
Date: Mon Mar 28 23:59:26 2016 -0400

testing nit: allow \*just\* EqEq to have skip suffix  
(ie: fall through switch-block \*first\*)

src/e2e-tests.sh | 9 +++++----  
1 file changed, 5 insertions(+), 4 deletions(-)

commit 91cfa9119a1773976c4d5f348a633e7a1ef2c684  
Author: Jonathan Zacsh [jzacsh@gmail.com](mailto:jzacsh@gmail.com)  
Date: Mon Mar 28 23:56:36 2016 -0400

GH-#7: test for lock-in to multi-line equation

src/tests/test-simple-equation.eq | 7 +++++++  
src/tests/test-simple-equation.out | 1 +  
2 files changed, 8 insertions(+)

commit c01da9166cfdb95987530d0521591a955f63452a  
Author: Jonathan Zacsh [jzacsh@gmail.com](mailto:jzacsh@gmail.com)  
Date: Mon Mar 28 23:52:28 2016 -0400

noop: rm unnecessary suffix on tests/\*`out` file  
(and fixes typo in script's print messages)

src/e2e-tests.sh | 2 +-  
src/tests/test-print-multi-find.out | 2 ++  
src/tests/test-print-multi-find.skip.out | 2 --  
3 files changed, 3 insertions(+), 3 deletions(-)

commit 0607b3272f89f24659d3ba9e845ba9ca5f5059fb  
Author: Jonathan Zacsh [jzacsh@gmail.com](mailto:jzacsh@gmail.com)  
Date: Mon Mar 28 23:43:28 2016 -0400

GH-#14: demonstrate "skip" tests for TDD coding

Takes a first example of broken codegen (we knowingly left out of GH-#12 to get min-viable) and uses it to show how to easily write SKIP tests ahead of time, so we can write as many example programs as we can encode our expectations in the codebase and see them printed w/every `make test` :D

src/e2e-tests.sh | 7 ++++++-  
src/tests/test-print-multi-find.skip.eq | 15 ++++++  
src/tests/test-print-multi-find.skip.out | 2 ++  
3 files changed, 23 insertions(+), 1 deletion(-)

commit 0a011a8612dd6a36233193c308b191cf64009c94  
Author: Jonathan Zacsh [jzacsh@gmail.com](mailto:jzacsh@gmail.com)  
Date: Mon Mar 28 23:27:21 2016 -0400

backfill coverage of what we enabled in 6b8990128b

- shows we can have multiple variables and variables:
  - are arbitrary
  - are not dependent on the `find` argument
- shows not hardcoding our `printf` (as per our previous min-compile hack)

src/tests/test-print-basic.eq | 9 ++++++  
src/tests/test-print-basic.out | 2 ++  
2 files changed, 11 insertions(+)

commit 2117bd7f8829a59057f55dc00894e7641ff2579e  
Author: Jonathan Zacsh [jzacsh@gmail.com](mailto:jzacsh@gmail.com)  
Date: Mon Mar 28 23:19:27 2016 -0400

e2e tests: make test output easier to read & debug

- make skipped tests easier to see
- show global summary of all three stats: PASS, FAIL, SKIP
- only apply `-v`erbose output on failures

src/e2e-tests.sh | 47 ++++++-----  
1 file changed, 30 insertions(+), 17 deletions(-)

commit 6b8990128b54dc73e920863bc0900fd0dfcf9650  
Author: Nam Hoang [nh2110@columbia.edu](mailto:nh2110@columbia.edu)  
Date: Mon Mar 28 18:57:12 2016 -0400

GH-12 implement codegen

src/codegen.ml | 211 ++++++-----  
src/tests/test-helloworld.eq | 2 +-  
2 files changed, 35 insertions(+), 178 deletions(-)

commit f3979150f45491b920232f2eec87d1193c723d12  
Author: Nam Hoang [nh2110@columbia.edu](mailto:nh2110@columbia.edu)  
Date: Mon Mar 28 18:56:09 2016 -0400

update strtlit to not include the leading quote

src/scanner.mll | 2 +-  
1 file changed, 1 insertion(+), 1 deletion(-)

commit f70193219872aa92e1704c786eb07089f0881f85  
Author: Nam Hoang [nnh2110@columbia.edu](mailto:nnh2110@columbia.edu)  
Date: Mon Mar 28 18:00:17 2016 -0400

having problem with unbound body

src/codegen.ml | 22 ++++++-----  
1 file changed, 20 insertions(+), 2 deletions(-)

commit 460e39d258a0f775c6f171cccb66c270ccdfa5da  
Author: Nam Hoang [nnh2110@columbia.edu](mailto:nnh2110@columbia.edu)  
Date: Mon Mar 28 17:19:05 2016 -0400

fix unmatched strlit in pretty printer

src/ast.ml | 3 +-  
1 file changed, 2 insertions(+), 1 deletion(-)

commit 694d808e39a13e5fe2327ad643a50fe94a60dd65  
Author: Jonathan Zacsh [jzacsh@gmail.com](mailto:jzacsh@gmail.com)  
Date: Sat Mar 26 20:28:53 2016 -0400

no readlink: more hacks for osx and utilities they don't have

src/e2e-tests.sh | 14 ++++++----  
1 file changed, 10 insertions(+), 4 deletions(-)

commit 4f3ca32ee54d1446c4517fcec7c6cc54a889d7f6  
Author: Jonathan Zacsh [jzacsh@gmail.com](mailto:jzacsh@gmail.com)  
Date: Sat Mar 26 20:13:47 2016 -0400

`make test`: ensure readable output even on mac

On OSX, get escaped strings instead of control characters' intended behavior.  
Thought these color codes were a portable-ish termcap thing. oh well.

src/e2e-tests.sh | 5 +++++  
1 file changed, 5 insertions(+)

commit 94cd4c7e79acb8fb059cc17565e5f03f38230b18  
Author: Jonathan Zacsh [jzacsh@gmail.com](mailto:jzacsh@gmail.com)  
Date: Sat Mar 26 20:10:17 2016 -0400

osx's `wc` uses short opts only, no --line[1]

Scrape from jimmy [massive-single-file  
commit](<https://github.com/rxie25/PLT2016Spring/commit/309027b4fbcbbb6a26974791f53cf15273fcaa71>)  
[1]: too bad, less readable in a long script

src/e2e-tests.sh | 4 +-  
1 file changed, 2 insertions(+), 2 deletions(-)

commit c18e2cec4269e6638aec756dd8c09d4459d6ab74  
Author: Jonathan Zacsh [jzacsh@gmail.com](mailto:jzacsh@gmail.com)

Date: Thu Mar 24 23:47:54 2016 -0400

```
rm'd obsolete TODO that I now disagree[1] with
[1]: ie, i think the answer is: we have no use/analagous need to these APIs.
```

src/codegen.ml | 6 -----  
1 file changed, 6 deletions(-)

commit c09282b3019c95100b98bf0818b167a44a430500  
Author: Jonathan Zacsh [jzacsh@gmail.com](mailto:jzacsh@gmail.com)  
Date: Thu Mar 24 02:47:57 2016 -0400

```
doc: link helloworld milesteone on visible TODO li
```

src/README.md | 2 +-  
1 file changed, 1 insertion(+), 1 deletion(-)

commit 2c9c138d09b7554500542293fccab7bfaa56d288  
Author: Jonathan Zacsh [jzacsh@gmail.com](mailto:jzacsh@gmail.com)  
Date: Thu Mar 24 02:04:43 2016 -0400

```
updated "status" & added how-to doc on Testing
```

src/README.md | 22 ++++++-----  
1 file changed, 19 insertions(+), 3 deletions(-)

commit 76a76dc65ba3db980e934bc297b13088749c3160  
Author: Jonathan Zacsh [jzacsh@gmail.com](mailto:jzacsh@gmail.com)  
Date: Thu Mar 24 01:43:38 2016 -0400

```
make test is a target in our src/ tree. go there to do ci
```

.travis.yml | 4 +++-  
1 file changed, 3 insertions(+), 1 deletion(-)

commit 4713486008e7f8513c5b585a718c137fd2f41b53  
Author: Jonathan Zacsh [jzacsh@gmail.com](mailto:jzacsh@gmail.com)  
Date: Thu Mar 24 01:39:18 2016 -0400

```
bah! typo: d06d96e04e855c37d1b7 should have been on *install* command
```

.travis.yml | 4 ++--  
1 file changed, 2 insertions(+), 2 deletions(-)

commit d06d96e04e855c37d1b75f3de254d2587b3a256a  
Author: Jonathan Zacsh [jzacsh@gmail.com](mailto:jzacsh@gmail.com)  
Date: Thu Mar 24 01:35:05 2016 -0400

```
(hopefully) fix `/usr/bin/ld: cannot find -lLLVM-3.4`[1]
caused by:
``bash
$ opam install --yes llvm.3.4 ocamlfind
````  
Full log here: https://travis-ci.org/rxie25/PLT2016Spring/builds/118158806#L347
```

.travis.yml | 2 +-
1 file changed, 1 insertion(+), 1 deletion(-)

commit 23d7172baa629c9db17e211169ddec0f44ed3e1
Author: Jonathan Zacsh jzacsh@gmail.com
Date: Thu Mar 24 01:29:50 2016 -0400

```
ci config still had CLI blocking it
```

.travis.yml | 8 ++++----
1 file changed, 4 insertions(+), 4 deletions(-)

commit 52692add426c925596c30c2753a6cdc6d35b373
Author: Jonathan Zacsh jzacsh@gmail.com
Date: Thu Mar 24 01:25:17 2016 -0400

```
do not hang ci-config on `opam init` interactive UI.
```

.travis.yml | 2 +-
1 file changed, 1 insertion(+), 1 deletion(-)

commit 208d0fc8392c81f8831976a3b0e7ebf1c7de922d
Author: Jonathan Zacsh jzacsh@gmail.com
Date: Thu Mar 24 01:20:27 2016 -0400

```
ci setup: straight copy/paste from ./INSTALL  
  
(gist was 3 years old anyway)
```

.travis-ci.sh | 26 -----
.travis.yml | 16 +++++-----
2 files changed, 6 insertions(+), 36 deletions(-)

commit fab4018be0f4189081a8f14a471236791a4df764
Author: Jonathan Zacsh jzacsh@gmail.com
Date: Thu Mar 24 01:12:12 2016 -0400

```
fix ci integration error "permission denied"
```

.travis.yml | 2 +-
README.md | 2 +-
2 files changed, 2 insertions(+), 2 deletions(-)

commit 817feb39487d05d01651e79a6f1a89e7624a0315
Author: Jonathan Zacsh jzacsh@gmail.com
Date: Thu Mar 24 01:08:40 2016 -0400

```
doc: link to src/ tree in top-level readme
```

README.md | 1 +
1 file changed, 1 insertion(+)

commit 0694fa1e468b56b52d31bdf4d3f45b59d575e0b8
Author: Jonathan Zacsh jzacsh@gmail.com
Date: Thu Mar 24 01:08:26 2016 -0400

clarify what this repository is school-related, in case others stumble into it

README.md | 2 +-
1 file changed, 1 insertion(+), 1 deletion(-)

commit 3f3b027802e48a8a998a9a7e109970d215891277

Author: Jonathan Zacsh jzacsh@gmail.com

Date: Thu Mar 24 01:07:30 2016 -0400

doc: scanner OK w/our hello-world as of 58c6fc2802a68

src/README.md | 33 ++++++-----

1 file changed, 30 insertions(+), 3 deletions(-)

commit c88db0320f350d07779d50dcf7fc4dd4a41c015a

Author: Jonathan Zacsh jzacsh@gmail.com

Date: Thu Mar 24 01:05:48 2016 -0400

update docs to point loudly at build status

src/README.md | 3 +-
1 file changed, 2 insertions(+), 1 deletion(-)

commit 594a714c3cabeb3b6ee673519581eede13a1e012

Author: Jonathan Zacsh jzacsh@gmail.com

Date: Thu Mar 24 01:05:08 2016 -0400

oops: travis CI expects stuff i *top* dir, not arbitrary src/

.travis-ci.sh | 26 ++++++-----

.travis.yml | 14 ++++++-----

src/.travis-ci.sh | 26 -----

src/.travis.yml | 14 -----

4 files changed, 40 insertions(+), 40 deletions(-)

commit 9704a3d9d3494ff6cd7c7083b230f3b1ec1f7468

Author: Jonathan Zacsh jzacsh@gmail.com

Date: Thu Mar 24 00:53:02 2016 -0400

untested: sets up ci w/copy-pasta by avsm ppa

****t;dr**** trying to `make test` automatically on `git push`

Copy/pasted mostly [from really old gist] (<https://gist.github.com/avsm/6757425>)
by same exact author whose Ubuntu ppa is popularly used (and in our ./INSTALL
file I think). Taken from gist at it's rev c1980c6f8d84049b794ba

src/.travis-ci.sh | 26 ++++++-----

src/.travis.yml | 14 ++++++-----

2 files changed, 40 insertions(+)

commit 4f8c7138335d6d20b706307e47822164f517f928

Author: Jonathan Zacsh jzacsh@gmail.com

Date: Thu Mar 24 00:43:14 2016 -0400

noop(nit) colorcoding test output

src/e2e-tests.sh | 27 ++++++-----
1 file changed, 19 insertions(+), 8 deletions(-)

commit 75771a89839b48ec77863e20d2e9e2b93b788f31
Author: Jonathan Zacsh jzacsh@gmail.com
Date: Thu Mar 24 00:18:32 2016 -0400

```
update Makefile per `ocamldep` output

`$ make lint` and got:
```diff
--- /dev/fd/63 2016-03-24 00:17:04.162510955 -0400
+++ /dev/fd/62 2016-03-24 00:17:04.162510955 -0400
@@ -1,9 +1,9 @@
-# make parser &&
-# ocamldep *.ml *.mli
ast.cmo :
ast.cmx :
codegen.cmo : ast.cmo
codegen.cmx : ast.cmx
+debugtokens.cmo : scanner.cmo parser.cmi ast.cmo
+debugtokens.cmx : scanner.cmx parser.cmx ast.cmx
eqeq.cmo : semant.cmo scanner.cmo parser.cmi codegen.cmo ast.cmo
eqeq.cmx : semant.cmx scanner.cmx parser.cmx codegen.cmx ast.cmx
parser.cmo : ast.cmo parser.cmi
```

```sh
ERROR: generated `ocamldep` in Makefile is out of date
```
```

src/Makefile | 2 ++
1 file changed, 2 insertions(+)

commit fa6b6ffcad944fbb2cca55f8a07e5f2ebc5d5b7
Author: Jonathan Zacsh jzacsh@gmail.com
Date: Thu Mar 24 00:17:49 2016 -0400

```
update reade to reflectwhat `test` target does now
```

src/README.md | 19 ++++++-----
1 file changed, 9 insertions(+), 10 deletions(-)

commit 5d009d2318683fe64ffba96bc7f8b75f6e59fe2d
Author: Jonathan Zacsh jzacsh@gmail.com
Date: Thu Mar 24 00:15:47 2016 -0400

```
noop(readability) make indentation in bash script consistent
```

src/e2e-tests.sh | 106 ++++++-----
1 file changed, 51 insertions(+), 55 deletions(-)

commit 402f0fbdce05adb0126343df2b6da582c032fb4
Author: Jonathan Zacsh jzacsh@gmail.com
Date: Thu Mar 24 00:09:37 2016 -0400

```
fix e2e bash hack (never again): passing now!

1. .gitignore latest version of log file this test outputs
2. Makefile doesn't need to point to tests/ dir, so stop doing that
3. do better job of handling test files as args (ugh.. bash)
4. bells/whistles:
   - adds test summary beginning/end
   - correctly captures test status and prints relevant message
   - breaks less easily with strange/accidental args
```

src/.gitignore | 2 +-
src/Makefile | 2 +-
src/e2e-tests.sh | 203 ++++++-----
3 files changed, 130 insertions(+), 77 deletions(-)

commit c03f264ade9bfb5a53a60e80fb3626de6cf54799
Author: Jonathan Zacsh jzacsh@gmail.com
Date: Wed Mar 23 21:26:24 2016 -0400

noop(ish): bash - always(ish) use quotes

src/e2e-tests.sh | 2 +-
1 file changed, 1 insertion(+), 1 deletion(-)

commit ee827e86c3e3d80bce15d156b1c9d5c9846a42dd
Author: Tianci Zhong tz2278@columbia.edu
Date: Wed Mar 23 21:19:28 2016 -0400

change globallog

src/e2e-tests.sh | 2 +-
1 file changed, 1 insertion(+), 1 deletion(-)

commit 85e99570cd813398bede3ee55c44ffe0c0956518
Author: Jonathan Zacsh jzacsh@gmail.com
Date: Wed Mar 23 21:12:48 2016 -0400

GH-#11: make dummy C more closely match .out file

src/codegen.ml | 2 +-
1 file changed, 1 insertion(+), 1 deletion(-)

commit 4734a03cf07c48cc626412451e6a88ecf806063c
Author: Tianci Zhong tz2278@columbia.edu
Date: Wed Mar 23 18:45:34 2016 -0400

wrong dependency list

src/Makefile | 2 +-
1 file changed, 1 insertion(+), 1 deletion(-)

commit ed65fc8efaf14f2a37da4fa3066aa4449141cc6d
Author: Tianci Zhong tz2278@columbia.edu
Date: Wed Mar 23 18:42:14 2016 -0400

fix c code

src/codegen.ml | 2 +-
1 file changed, 1 insertion(+), 1 deletion(-)

commit 51b192f007b4bf5023072f132af4a9c02f421303
Author: Tianci Zhong tz2278@columbia.edu
Date: Wed Mar 23 18:34:17 2016 -0400

fix the c code

src/codegen.ml | 4 ++--

1 file changed, 2 insertions(+), 2 deletions(-)

commit 45fde9c6a864752af2653303a7c599818416fdf5

Author: Jonathan Zacsh jzacsh@gmail.com

Date: Wed Mar 23 18:26:26 2016 -0400

updates docs & test script enabling auto-completion

test script was named identically to directory, so i couldn't autocompelte it easily in my shell :) i can now. also updated documentation

src/Makefile | 6 +-

src/README.md | 2 +-

src/e2e-tests.sh | 217 +++

src/testall.sh | 217 -----

4 files changed, 222 insertions(+), 220 deletions(-)

commit cee46f004d42fb4014c22dc2e1eef06bc7ef45b8

Author: Jonathan Zacsh jzacsh@gmail.com

Date: Wed Mar 23 18:20:40 2016 -0400

total rewrite of `./testall.sh` script

```
t;dr can now run
```bash
```

```
$ make test
```

```
$ make TEST_OPTS=-dv test # equiv to passing args to script: ./testall.sh -dv
```
```

unfortunately, rewrote e2e test script from from ground up since:

- a) found it too hard to pick apart LLVM/concepts and add our own (ie: we don't target machine executable)
- b) i can read this bash now
- c) not invented here syndrome
- d) not invented here syndrome

src/Makefile | 9 +-

src/testall.sh | 359 +++++++++++++++++++++++++++++++++++++-----

2 files changed, 194 insertions(+), 174 deletions(-)

commit 58c6fc2802a6858b83a0cd45ee4a4b50ec63c7de

Author: Jonathan Zacsh jzacsh@gmail.com

Date: Wed Mar 23 14:30:34 2016 -0400

fix grammar: only Context IDs (CTX!) prepends a find-decl

src/parser.mly | 2 +-

1 file changed, 1 insertion(+), 1 deletion(-)

commit a3528554c013d40ca90d369935a2b36793680656

Author: Jonathan Zacsh jzacsh@gmail.com

Date: Wed Mar 23 14:01:26 2016 -0400

scanner: str literals (for future builtin params)

- adds STRLIT we discussed, but never got to
- makes use of it in grammar (untested)

src/ast.ml | 1 +
src/debugtokens.ml | 1 +
src/parser.mly | 7 ++++++-
src/scanner.mll | 1 +
4 files changed, 9 insertions(+), 1 deletion(-)

commit dcb15739854e453a948b6bd288d486e570bfa1cf
Author: Jonathan Zacsh jzacsh@gmail.com
Date: Wed Mar 23 13:13:10 2016 -0400

document new tools developed with help of TA

src/README.md | 23 ++++++
1 file changed, 23 insertions(+)

commit ac3580ab9f9a4e8b571182c34fd5c2e670a9e65f
Author: Jonathan Zacsh jzacsh@gmail.com
Date: Wed Mar 23 13:08:02 2016 -0400

noop(cleanup) removes unused deadcode

src/debugtokens.ml | 4 ----
1 file changed, 4 deletions(-)

commit 1123662e0b75ebd09d09b9ba9da22522a8afc4dd
Author: Jonathan Zacsh jzacsh@gmail.com
Date: Wed Mar 23 13:07:36 2016 -0400

noop: whitespace cleanup

src/debugtokens.ml | 4 ++--
1 file changed, 2 insertions(+), 2 deletions(-)

commit b46b460ae5f87dfcf611d28528f8c26c30835d29
Author: Jonathan Zacsh jzacsh@gmail.com
Date: Wed Mar 23 13:07:05 2016 -0400

grammar: funcdecl_list tries to recurse on basecase without empty basecase

src/parser.mly | 1 +
1 file changed, 1 insertion(+)

commit fd52c238501cb94938af3a484865eb8c11e83000
Author: Jonathan Zacsh jzacsh@gmail.com
Date: Wed Mar 23 13:06:40 2016 -0400

grammar: utilize unused "colon" from 10adabf2b8

src/parser.mly | 8 ++++----
1 file changed, 4 insertions(+), 4 deletions(-)

commit f7e5d0a528f5f478b854d8da5eb81b56662d11ff
Author: Jonathan Zacsh jzacsh@gmail.com
Date: Wed Mar 23 13:05:33 2016 -0400

adds debugging helper to dump what our scanner interprets for agiven source proram

src/Makefile | 5 +++--
src/debugtokens.ml | 46 +++++
2 files changed, 49 insertions(+), 2 deletions(-)

commit 26c5fdcff3ccc137c25d3f04aa28f658aefaae0
Author: Jonathan Zacsh jzacsh@gmail.com
Date: Wed Mar 23 13:04:05 2016 -0400

noop(nit) remove redundant astrisk

src/scanner.mll | 2 +-
1 file changed, 1 insertion(+), 1 deletion(-)

commit 10adabf2b876c2522bc0d76659b9f1e01c4f8920
Author: Jonathan Zacsh jzacsh@gmail.com
Date: Wed Mar 23 13:03:42 2016 -0400

bug: fix scanner not adhering to LRM: need colon before `find` exprs

src/scanner.mll | 1 +
1 file changed, 1 insertion(+)

commit 6c718d54f7b520e0cbb1e50b90a4f567d7ff9d38
Author: Jonathan Zacsh jzacsh@gmail.com
Date: Wed Mar 23 13:02:59 2016 -0400

bug: our example's Context did not abide by our own LRM

src/tests/test-helloworld.eq | 4 ++--
1 file changed, 2 insertions(+), 2 deletions(-)

commit 825e0c668aebb24ead537fa039c5f4accf216bb7
Author: Jonathan Zacsh jzacsh@gmail.com
Date: Mon Mar 21 20:30:35 2016 -0400

fix ocaml compilation error (*really* compiling now)

src/eqeq.ml | 4 ++--
1 file changed, 2 insertions(+), 2 deletions(-)

commit e40d95719d4271374b99bfba6b5dcd66fd570767
Author: Jonathan Zacsh jzacsh@gmail.com
Date: Mon Mar 21 20:24:29 2016 -0400

oops: broken EqEq compiler did nothing quietly
(from frantic group session trying to get a passing `ocamlbuild`)

src/eqeq.ml | 10 ++++-----
1 file changed, 4 insertions(+), 6 deletions(-)

commit 311b8163651a4ecc9b0076db7d98d313af1a5331
Author: Jonathan Zacsh jzacsh@gmail.com

Date: Mon Mar 21 20:16:09 2016 -0400

```
rm old MicroC test already ported as "helloworld"
also updates our test to be actually "helloworld" and not the typo "hellworld"
```

```
src/tests/test-hello.mc | 7 -----
src/tests/test-hello.out | 3 ---
src/tests/test-helloworld.eq | 7 ++++++++
src/tests/test-helloworld.out | 1 +
src/tests/test-hellworld.eq | 7 -----
src/tests/test-hellworld.out | 1 -
6 files changed, 8 insertions(+), 18 deletions(-)
```

commit 5849ce0543cc4eb50d5b7641b3b4837dd8ddc678
Author: Jonathan Zacsh jzacsh@gmail.com
Date: Mon Mar 21 20:14:10 2016 -0400

```
update `dev` section of our doc
```

```
src/README.md | 6 ++++-
1 file changed, 5 insertions(+), 1 deletion(-)
```

commit 90245a539905782bb85b27b54b0a6749eb003937
Author: Jonathan Zacsh jzacsh@gmail.com
Date: Mon Mar 21 20:12:49 2016 -0400

```
(oops) fix last commit: made last minute breaking change (LLVM refs) to OCAML_BLD_OPTS
```

```
src/Makefile | 2 +-
1 file changed, 1 insertion(+), 1 deletion(-)
```

commit 84a0e0ed7d22d43976dd2d90fc18b0739fa8b929
Author: Jonathan Zacsh jzacsh@gmail.com
Date: Mon Mar 21 20:10:55 2016 -0400

```
adds quick `make lint` script to ensure we have the latest `ocamldep` output
```

```
src/Makefile | 3 +++
src/lint.sh | 26 +++++++++++++++++++++++++++++++++++++
2 files changed, 29 insertions(+)
```

commit 1ca502a6d7c32742b9179331dca16fd2b8e58153
Author: Jonathan Zacsh jzacsh@gmail.com
Date: Mon Mar 21 20:09:46 2016 -0400

```
gets EqEq comipiling through `ocamlbuild`

(note: not necessarily at our parallelize-workload step yet)
also, tangentially:
- reorders `make` targets to set PHONY helpers to bottom
- cleans up obsolete references to LLVM from MicroC
- documents how to specify `menhir` as parser generator
```

```
src/Makefile | 50 +++++++++++++++++++++++++++++++++++++-----
src/eqeq.ml | 30 +++++++++++++++++++++++++++++++++++++
src/microc.ml | 30 -----
3 files changed, 51 insertions(+), 59 deletions(-)
```

commit fbaed234d388b89af1a990a62f2b49d07329f70d
Author: Jonathan Zacsh jzacsh@gmail.com
Date: Mon Mar 21 19:28:52 2016 -0400

removing unused DummyGen

src/microc.ml | 2 +-
1 file changed, 1 insertion(+), 1 deletion(-)

commit b9fa88ef2d0d4ef441be759a82e0ccfc9ae13b4d
Author: Tianci Zhong tz2278@columbia.edu
Date: Mon Mar 21 19:19:55 2016 -0400

try

src/ast.ml | 2 +-
1 file changed, 1 insertion(+), 1 deletion(-)

commit b3c26e95a619b7d460d5201d36b1a19f1a795ab9
Author: Nam Hoang nh2110@columbia.edu
Date: Mon Mar 21 19:19:28 2016 -0400

fix scanner and parser for finddecl and funcdecl

src/ast.ml | 36 ++++++-----
src/microc.ml | 6 ++++--
src/parser.mly | 22 ++++++-----
3 files changed, 33 insertions(+), 31 deletions(-)

commit 812f6446e1b12c978d2176480b3619ec5db10827
Author: Jonathan Zacsh jzacsh@gmail.com
Date: Mon Mar 21 18:23:26 2016 -0400

trying to tests passing with dummy compiler phases

- updates testsall.sh to target egeq correctly
- simplifies Makefile for our project
- removes tests we don't care about for first round

src/Makefile | 60 ++++++-----
src/ast.ml | 3 +--
src/codegen.ml | 6 ++++--
src/microc.ml | 16 +++-----
src/semant.ml | 4 +-
src/testall.sh | 26 ++++++-----
src/tests/test-find.eq | 3 ---
src/tests/test-find.out | 1 -
src/tests/test-gcd.eq | 31 -----
src/tests/test-gcd.mc | 15 -----
src/tests/test-gcd.out | 3 ---
src/tests/test-hellworld.eq | 7 ++++++
src/tests/test-hellworld.out | 1 +
13 files changed, 52 insertions(+), 124 deletions(-)

commit b33150f5b889e02b569349f63bf93066d84168cb
Author: Jonathan Zacsh jzacsh@gmail.com
Date: Mon Mar 21 16:08:03 2016 -0400

ensure `make test` cleans before doing anything

src/Makefile | 2 +-
1 file changed, 1 insertion(+), 1 deletion(-)

commit 49e31bb62e1a34e6cc24bf14b8386a975c9a5ed1
Author: Jonathan Zacsh jzacsh@gmail.com
Date: Mon Mar 21 14:59:28 2016 -0400

GH-#8 mark missing APIs in `codegen`, to get helloworld
- to get hello world working, we'll just have a codegen file that does:
...
print '#include "stdio"\nint main() { print(42); }'
...

src/codegen.ml | 6 ++++++
src/microc.ml | 46 ++++++-----
2 files changed, 37 insertions(+), 15 deletions(-)

commit 5f58c11a19c9156ac326e53d281d290d859c0219
Author: Jonathan Zacsh jzacsh@gmail.com
Date: Mon Mar 21 14:32:42 2016 -0400

GH-#8 dumb semant-analy, start codegen anyway...
stopping work on semantic analysis, and going to create a godegen that prints
straight `int main() { print(42); }`, so we can start parallelizing tasks (ie:
have each of us work on one file,, and have a shared e2e test to run our code
against).

src/codegen.ml | 14 +-----
1 file changed, 1 insertion(+), 13 deletions(-)

commit d1eeecdee958b6f3045696c30feb94eef4666789
Author: Jonathan Zacsh jzacsh@gmail.com
Date: Mon Mar 21 14:30:52 2016 -0400

GH-#8: commented-out micro-progress on sem-analysis

src/semant.ml | 11 ++++++----
1 file changed, 7 insertions(+), 4 deletions(-)

commit e8c2a0c882b4b3e5a540431ee173177caf4bd93f
Author: Jonathan Zacsh jzacsh@gmail.com
Date: Mon Mar 21 14:10:12 2016 -0400

GH-#8: authors last-line of `check_find`: `check_have_context`

src/semant.ml | 6 ++++++
1 file changed, 6 insertions(+)

commit 11d5e285859c1febfd231f3f9953b816d217fa3d
Author: Jonathan Zacsh jzacsh@gmail.com
Date: Mon Mar 21 14:07:36 2016 -0400

GH-#8: (nitpick) short-circuit-ish; just fail faster when we do not even recognize a `find` target

src/semant.ml | 2 +-
1 file changed, 1 insertion(+), 1 deletion(-)

commit 9f37959d32e1822ac8bd0299491e6311ffb3e01e
Author: Jonathan Zacsh jzacsh@gmail.com
Date: Mon Mar 21 14:04:41 2016 -0400

GH-#8: report duplicate contexts when we build our map of them

src/semant.ml | 7 ++++++-
1 file changed, 6 insertions(+), 1 deletion(-)

commit 1b4aafbf5393adee1004a4a0ff07a901cb87047c
Author: Jonathan Zacsh jzacsh@gmail.com
Date: Mon Mar 21 14:01:16 2016 -0400

noop(documentatino) reorganizes some big-banner comments to clarify what sem-analy is doing

src/semant.ml | 7 +++----
1 file changed, 3 insertions(+), 4 deletions(-)

commit 26a3908e74efb1b482ba4b0ec142a2aaaf9b20ef
Author: Jonathan Zacsh jzacsh@gmail.com
Date: Mon Mar 21 13:58:40 2016 -0400

GH-#8: builds a map of our known contexts

src/semant.ml | 5 ++++-
1 file changed, 4 insertions(+), 1 deletion(-)

commit c058c6fdf0bdb20168f8c91b9788619ad814efda
Author: Jonathan Zacsh jzacsh@gmail.com
Date: Mon Mar 21 13:39:52 2016 -0400

GH-#8: outlines TODOs and resturctures for EqEq

Note: `check_{stmt,expr}` have moved to top-level of `check` API, as they need to be performed for both `find` and Context blocks. Further put large TODO in place where we expect all our interesting context-checking to happen....

Namely: that unknown variables go into a local `equations_to_solve` so we can complain later when we call `check_find` and see a find expression that tries to solve something without the necessary missing pieces

src/semant.ml | 200 +++-----
1 file changed, 104 insertions(+), 96 deletions(-)

commit 0c4c6395d8859a2b36d48233e4cfccefd4d8c4b
Author: Jonathan Zacsh jzacsh@gmail.com
Date: Mon Mar 21 13:19:07 2016 -0400

noop(readability) oops: fix 20c9937ebd2ac972b85c indented things too far

src/semant.ml | 74 +++-----
1 file changed, 37 insertions(+), 37 deletions(-)

commit 20c9937ebd2ac972b85cea1ba290bf93ac83a676
Author: Jonathan Zacsh jzacsh@gmail.com

Date: Mon Mar 21 12:37:41 2016 -0400

noop(readability) indent ocaml so i can understand its meaning as an ocaml n00b

src/semant.ml | 66 ++++++-----

1 file changed, 36 insertions(+), 30 deletions(-)

commit 656381ac753835b652a7c54e35096db464579dff

Author: Jonathan Zacsh jzacsh@gmail.com

Date: Mon Mar 21 00:21:46 2016 -0400

GH-#8 update `check` API of semantic analysis

****NOTE****: this doesn't *fix* our semantic analysis, just takes the first shareable step: renames the top-level API signature to clarify what the semantic analysis *should* be iterating over (ie: what our `ast`/LRM thinks an EqEq program *is*).

****Next step****: walk through each `contexts` and `finds` reference in this file and update it to match our real AST, and actually perform checks that we really want to perform (eg: "is this `find` applying to an actual context we know about?").

src/semant.ml | 60 ++++++-----

1 file changed, 25 insertions(+), 35 deletions(-)

commit 372d17d3d08836bfff6d59649ad2b7f5545e9ae1

Author: Jonathan Zacsh jzacsh@gmail.com

Date: Sun Mar 20 21:05:43 2016 -0400

GH-#8: document next-step to Hello World (semantic analysis left in broken state)

notes/microc-to-eqeq.md | 25 ++++++-----

1 file changed, 18 insertions(+), 7 deletions(-)

commit 382bb8d861f05f43efa94953a4a198b9600977e1

Author: Jonathan Zacsh jzacsh@gmail.com

Date: Sun Mar 20 21:04:34 2016 -0400

noop(docs) shift/reduce already fixed by 51f275435349af438020d95a3

notes/microc-to-eqeq.md | 22 -----

1 file changed, 22 deletions(-)

commit b3a2892a09855d6ee51dc0a0cafd50cb24d4e68e

Author: Jonathan Zacsh jzacsh@gmail.com

Date: Sun Mar 20 19:43:48 2016 -0400

noop(readability) reformat block to show its let/in relationship

src/semant.ml | 8 +++++---

1 file changed, 5 insertions(+), 3 deletions(-)

commit f673af375b274473fc85b062a964c8a9ed67e574

Author: Jonathan Zacsh jzacsh@gmail.com

Date: Sun Mar 20 15:10:03 2016 -0400

GH-#9: add generic `func()` call back for buitins

brings back deleted code and renames it to `Builtin` rather than more generic `Call`, to clarify intention.

Successfully tested this change by running following w/o errors:

```
...
$ make scanner
ocamllex scanner.mll
50 states, 1574 transitions, table size 6596 bytes
```

```
$ make parser
ocamlyacc parser.mly
...
```

```
src/ast.ml | 4 ++--
src/codegen.ml | 4 ++--
src/parser.mly | 12 ++++++++--
src/semant.ml | 2 +-
4 files changed, 15 insertions(+), 7 deletions(-)
```

commit 9c05d8f9bb7950d31a8d9008f8da626e78b3f8e3

Author: Jonathan Zacsh jzacsh@gmail.com

Date: Sun Mar 20 15:07:05 2016 -0400

nit: moves gitignore for gen files into src/ where other gitignore is and documents and adds `scanner` output

```
.gitignore | 4 ----
src/.gitignore | 10 ++++++++
2 files changed, 10 insertions(+), 4 deletions(-)
```

commit 4f34b911eeb086c3f0261e6e1df72fa4bf2fb1b9

Author: Nam Hoang nh2110@columbia.edu

Date: Fri Mar 18 17:07:21 2016 -0400

update gitignore for parser binary files

```
.gitignore | 5 +++++
1 file changed, 5 insertions(+)
```

commit 51f275435349af438020d95a3c23f7c1739747e2

Author: Jonathan Zacsh jzacsh@gmail.com

Date: Fri Mar 18 00:44:15 2016 -0400

fixe issue #2 "context"s begin with uppercase

```
- shift/reduce conflict fixed. parser-generator found that our:
  1. contexts and equations look nearly identical. We acknowledge this
  throughout our LRM by capitalizing our context's names, eg: `Euclid`, not
  `euclid` (though were' not perfectly consistent... though that's true of our
  LRM genearily). I cannot find that we specified this formally anywhere, but
  I recall us talking about it.
  2. our context definition matched the rest of our program, practically. I
  believe we never caught this writing the LRM, but I'm making the call for us
  that it is okay to limit contexts to *only* only equations (and multi-line)
  equations. that is: no `print` statements in contexts. not sure what other
  negative impact this has (if that's even a negative impact).
- tangentially: fills in `string_of_[grammar]` functions that were quietly
  broken by previous major refactor, ddc7fa475f09d4d4dac7e9d1a64f1a8ed6f2956f
```

Example output of `menhir --explain parser.mly`, before this commit:

```
...
** Conflict (shift/reduce) in state 73.
** Token involved: ID
** This state is reached from program after reading:
```

```
decls CTX ASSIGN LBRACE
```

** The derivations that appear below have the following common factor:
** (The question mark symbol (?) represents the spot where the derivations begin to differ.)

```
program
decls EOF
decls ctxtdecl
      CTX ASSIGN LBRACE ctx RBRACE
      (?)
```

** In state 73, looking ahead at ID, shifting is permitted
** because of the following sub-derivation:

```
funcdecl
. ID ASSIGN LBRACE stmt_list RBRACE
```

** In state 73, looking ahead at ID, reducing production
** stmt_list ->
** is permitted because of the following sub-derivation:

```
stmt_list
stmt_list stmt // lookahead token appears because stmt can begin with ID
...
```

src/ast.ml | 38 ++++++-----
src/parser.mly | 12 +++++-----
src/scanner.mll | 6 +++++-
3 files changed, 39 insertions(+), 17 deletions(-)

commit d39168304f96e11d229126ca8d5a5c7505135b16
Author: Jonathan Zacsh jzacsh@gmail.com
Date: Fri Mar 18 00:17:17 2016 -0400

optionally run same `make` commands with just `PARSER_GENR=` changed

src/Makefile | 7 ++++---
1 file changed, 4 insertions(+), 3 deletions(-)

commit 6ed43573077d3d935ccd313c482ba162bfe49295
Author: Jonathan Zacsh jzacsh@gmail.com
Date: Fri Mar 18 00:13:32 2016 -0400

make it a *tiny* bit easier to auto-complete my make targets on scanner&parser phase

src/Makefile | 4 ++--
1 file changed, 2 insertions(+), 2 deletions(-)

commit c71bb6c9a4ac0c7b9b9e42a81ee7f2c9f1f16151
Author: Jonathan Zacsh jzacsh@gmail.com
Date: Thu Mar 17 23:55:41 2016 -0400

use relative URL, GH flavored MD supports this now

as of <https://github.com/blog/1395-relative-links-in-markup-files>
woot!

src/README.md | 4 +---
1 file changed, 1 insertion(+), 3 deletions(-)

commit ddc7fa475f09d4d4dac7e9d1a64f1a8ed6f2956f
Author: Jonathan Zacsh jzacsh@gmail.com
Date: Thu Mar 17 23:23:03 2016 -0400

```
rm microc-specific scanner/parser logic

.. leaves w/1 shift/reduce in place to be tackled next
```

Doesn't get scanner & parser 100% to epeq's LRM, but 99.9% there. This commit focuses simply on removing scanner/parser logic that do *not* exist in epeq, and leaves "TODO"-comments where more needs to be done (eg: see `parser.mly`'s TODO on global-level multi-line equations).

This commit also documents current state of this branch (and this commit) fully in `../notes/microc-to-epeq.md`, which has been copy/pasted here as my change summary:

```
> # Changes to MicroC Codebase
>
> At a high-level, this refactor:
> - Rebrands to "microc" where convenient (eg: in comments, just in files touched)
> - updates scanner and parser to adhere to our LRM (everything described below)
>
> Below was written while trying to keep track of removals that are taking place,
> in refactoring MicroC to match our LRM. This is necessary as a single list
> rather than `git diff` which includes implementation-details' tangential
> details. In other words, this document:
> - includes, "change peg to be round"
> - leaves out, "change holes 1,2,3,4,5,6,... to take round peg"
>
> ## ast.ml
>
> In summary:
> - removes: `Int`, `Void`, `Return`, `For`
> - removes: `func_decl`'s `typ`, `formals`, `locals`
> - ie: `func_decl` is now our "multi-line equation"
> - adds `find_decl`
>
> ```diff
> -type typ = Int | Bool | Void
> +type typ = Double | Bool
>
>
> @@ -22,16 +22,19 @@ type expr =
>  type stmt =
>    Block of stmt list
>    | Expr of expr
> -   | Return of expr
>    | If of expr * stmt * stmt
> -   | For of expr * expr * expr * stmt
>    | While of expr * stmt
>
>
> @@ -28,10 +28,10 @@ type stmt =
>
>  type func_decl = {
> -   typ : typ;
>    fname : string;
> -   formals : bind list;
> -   locals : bind list;
>    body : stmt list;
>  }
>
> +type find_decl = {
>
> @@ -84,17 +84,14 @@ let rec string_of_stmt = function
>
>  let string_of_typ = function
> -   Int -> "int"
> +   Double -> "double"
> -   | Void -> "void"
>  ...
>
>
> ## scanner.mll
>
> ```diff
> @@ -1,4 +1,4 @@
> -(* Ocamllex scanner for MicroC *)
> +(* Ocamllex scanner for EqualsEquals *)
>
>
> @@ -27,14 +27,7 @@ rule token = parse
> -| "for"      { FOR }
> -| "return"   { RETURN }
> -| "int"     { INT }
> -| "bool"    { BOOL }
> -| "void"    { VOID }
> -| "true"    { TRUE }
```

```

> -| "false" { FALSE }
> ...
>
> ## parser.mly
>
> In summary:
> - renames `fdecl` to `funcdecl`
> - removes `vdecl`
> - adds `finddecl`
> - updates `decls` to use it
> - cleans up refs to removals made in ast.ml
> - updates `expr` to remove concept of function calls (eg: `foo([opts])`)
>
> ``diff
> - decls
> + decls
>
> - fdecl
> + funcdecl
>
> - vdecl
>
> + finddecl
> ``
>
> # Effect of Changes
>
> This all leaves the entire second-half of the compiler's pipeline broken, but
> gives eeqq something to start with: **a working scanner & parser**. Well, at
> least according to this test:
> ``bash
> $ make clean
> ocamlbuild -clean
> rm -f testall.log *.diff microc scanner.ml parser.ml parser.mli parser.output
> rm -f *.cmx *.cmi *.cmo *.cmx *.o
> rm -f test-*.out test-*.ll
>
> $ make scanner.ml
> ocamllex scanner.mll
> 48 states, 1470 transitions, table size 6168 bytes
>
> $ make parser.ml
> ocaml yacc parser.mly
> 1 shift/reduce conflict.
> ``
> TODO: fix this shift/reduce error ^

```

```

notes/microc-to-eeqq.md | 116 ++++++
src/README.md | 7 +++
src/ast.ml | 27 +++++-----
src/parser.mly | 101 ++++++-----
src/scanner.mll | 9 +---
5 files changed, 172 insertions(+), 88 deletions(-)

```

```

commit 93d63ac34995eeca1c65183d657d34e07985791
Author: Jonathan Zacsh <jzacsh@gmail.com>
Date: Thu Mar 17 23:22:40 2016 -0400

```

```

nit: capture menhir logs in `make clean` logic

```

```

src/Makefile | 3 +-
1 file changed, 2 insertions(+), 1 deletion(-)

```

```

commit 41b21352ad905ade0abc79df0b0da6553ddad34d
Author: Jonathan Zacsh <jzacsh@gmail.com>
Date: Sat Mar 12 13:39:10 2016 -0500

```

```

start with broken test of find expressions

```

```

Example test-run, as of this commit:
``bash
$ make test

```

```
# snipped
test-find.eq...FAILED
./microc.native failed on ./microc.native < tests/test-find.eq > test-find.eq.ll
##### Testing test-find.eq
./microc.native < tests/test-find.eq > test-find.eq.ll
Fatal error: exception Failure("unrecognized function main")
##### FAILED

test-gcd.eq...FAILED
./microc.native failed on ./microc.native < tests/test-gcd.eq > test-gcd.eq.ll
##### Testing test-gcd.eq
./microc.native < tests/test-gcd.eq > test-gcd.eq.ll
Fatal error: exception Parsing.Parse_error
##### FAILED

Makefile:16: recipe for target 'test' failed
make: *** [test] Error 1
...
```

src/parser.mly | 15 ++++++++--
src/scanner.mll | 1 +
src/tests/test-find.eq | 3 +++
src/tests/test-find.out | 1 +
4 files changed, 18 insertions(+), 2 deletions(-)

commit 41dca7f2d40456ad71e256ba7fd26e54e9c5cccc
Author: Jonathan Zacsh jzacsh@gmail.com
Date: Sat Mar 12 13:38:07 2016 -0500

fail quickly if anything in this massive the script fails

src/testall.sh | 1 +
1 file changed, 1 insertion(+)

commit 93466b4c243b4c680624e6318402e832c2b52da9
Author: Jonathan Zacsh jzacsh@gmail.com
Date: Sat Mar 12 13:37:57 2016 -0500

directly print what happened at the end of a single test failing

src/Makefile | 2 +-
src/testall.sh | 21 ++++++++--
2 files changed, 20 insertions(+), 3 deletions(-)

commit b9069ba293741af96f4c8e1c0af8bd001d32fcc8
Author: Jonathan Zacsh jzacsh@gmail.com
Date: Sat Mar 12 12:35:04 2016 -0500

in ocaml hell, `llvm.analysis` cannot be found from one shell to another. who knows which fragile opam env. vars get

src/Makefile | 9 +++++--
1 file changed, 5 insertions(+), 4 deletions(-)

commit 5513f25758240b6214bfc5c4fc71212396fd1768
Author: Jonathan Zacsh jzacsh@gmail.com
Date: Sat Mar 12 09:53:52 2016 -0500

kick off e2e testing efforts with a full snippet

note: too complicated to be useful for "hello world" we want to target.

adds an `eq` (for EqualsEquals) test program forked from test-gcd.mc. Can be run with:


```
```bash
./testall.sh tests/*.eq
```
```

src/tests/test-gcd.eq | 31 ++++++
1 file changed, 31 insertions(+)

commit 79feff303ac5450fb5ac1e2d22b90b53e78283a3
Author: Jonathan Zacsh jzacsh@gmail.com
Date: Sat Mar 12 09:40:26 2016 -0500

noop: bah, damn github markdown. bulleted list

src/README.md | 1 +
1 file changed, 1 insertion(+)

commit 92319c8c315b8b3215f01342978b4b3136312623
Author: Jonathan Zacsh jzacsh@gmail.com
Date: Sat Mar 12 09:36:15 2016 -0500

noop: fix broken markup/indentation in "one-time setup" note

src/README.md | 19 ++++++-----
1 file changed, 9 insertions(+), 10 deletions(-)

commit 001d7ad75934fd81ed0945218d4ab49e4ac79c78
Author: Jonathan Zacsh jzacsh@gmail.com
Date: Sat Mar 12 09:27:34 2016 -0500

quick note to ensure a machine is setup before trying to debug our forking changes to microc

src/README.md | 14 ++++++
1 file changed, 14 insertions(+)

commit cb9b33161049b8d99f84a5c3c6255dc4c1e7ce9b
Author: Jonathan Zacsh jzacsh@gmail.com
Date: Fri Mar 11 17:19:54 2016 -0500

yet another copy-pasta from pre-lang-design meeting: %d still referenced in last-minute code snippet

notes/language-reference-manual.md | 6 +++--
1 file changed, 3 insertions(+), 3 deletions(-)

commit 1548af6bc79197445a2033c0f42d7941f36609cc
Author: Jonathan Zacsh jzacsh@gmail.com
Date: Thu Mar 10 22:46:40 2016 -0500

noop: whitespace/readability consistency cleanup throughout microc compiler codebase

src/INSTALL | 14 +++---
src/codegen.ml | 129 ++++++-----
src/microc.ml | 6 +--
src/parser.mly | 8 ++--
src/semant.ml | 122 ++++++-----
src/testall.sh | 76 ++++++-----
6 files changed, 176 insertions(+), 179 deletions(-)

commit 0b43c101a0ab7a7c4e4fd4b7e2b629f85535c542
Author: Jonathan Zacsh jzacsh@gmail.com
Date: Thu Mar 10 22:45:58 2016 -0500

extendig `clean` make target to also cleaup test failure files

src/Makefile | 1 +
1 file changed, 1 insertion(+)

commit f1b32ff99eadcaba0f7290ed92c8c0767d1467bd
Author: Jonathan Zacsh jzacsh@gmail.com
Date: Thu Mar 10 22:45:49 2016 -0500

noop: use `\$(RM)` make variable for removal

src/Makefile | 4 ++--
1 file changed, 2 insertions(+), 2 deletions(-)

commit b07e6ac7de1fd3e7a9ce0381d43da40c79ba5939
Author: Jonathan Zacsh jzacsh@gmail.com
Date: Mon Mar 7 22:26:28 2016 -0500

LRM (reference manual)'s master copy now lives on Jimmy's repo (which is itself master copy of our code)

README.md | 2 +-
1 file changed, 1 insertion(+), 1 deletion(-)

commit 87feec1683e135bb92b6e9c3584cb0bc80c9f16
Author: Jonathan Zacsh jzacsh@gmail.com
Date: Mon Mar 7 22:07:54 2016 -0500

huge number of spell-check fixes applied as i walked through doc with `aspell` and also applied consistency to "sub-ε

notes/language-reference-manual.md | 48 ++++++-----
1 file changed, 24 insertions(+), 24 deletions(-)

commit 52e57d31dbfb0c652ea8e7fb56d32d97ad43fa21
Author: Jonathan Zacsh jzacsh@gmail.com
Date: Mon Mar 7 21:58:56 2016 -0500

clarify that this bulleted list (which is not an ordered list) is indeed in-order; ie "precedence"

notes/language-reference-manual.md | 4 +++-
1 file changed, 3 insertions(+), 1 deletion(-)

commit 13f879bdeffd932e8eb683264d128ded1d19c7f9
Author: Jonathan Zacsh jzacsh@gmail.com
Date: Mon Mar 7 21:57:00 2016 -0500

document, as TODO, previous commit's finding on undocumented built-ins

notes/language-reference-manual.md | 2 ++
1 file changed, 2 insertions(+)

commit 4d1a9319f3a023268c20df7786447c283b211918
Author: Jonathan Zacsh jzacsh@gmail.com
Date: Mon Mar 7 21:56:31 2016 -0500

bug: "precedence & meaning" was a sub-section of built-ins...

notes/language-reference-manual.md | 3 +--
1 file changed, 1 insertion(+), 2 deletions(-)

commit 310c6ccfa5d3aa1b10268ca0e319787da9cbebcf
Author: Jonathan Zacsh jzacsh@gmail.com
Date: Mon Mar 7 21:53:33 2016 -0500

fix bah; another built-in, undocumented. replacing for now with math equivalence

notes/language-reference-manual.md | 4 ++--
1 file changed, 2 insertions(+), 2 deletions(-)

commit a49dc029cfa30dca68933d634441ffe8a632b8fd
Author: Jonathan Zacsh jzacsh@gmail.com
Date: Mon Mar 7 21:51:16 2016 -0500

yet another spot were we have a function call and possible confusion. this one is most likely a planned built-in

notes/language-reference-manual.md | 2 +-
1 file changed, 1 insertion(+), 1 deletion(-)

commit c408639e7385460670313326ea6b76984c019f53
Author: Jonathan Zacsh jzacsh@gmail.com
Date: Mon Mar 7 21:48:35 2016 -0500

fix really inexplicable whitespace uber-extra-line rendering of bullets in final PDF

notes/language-reference-manual.md | 7 +++----
1 file changed, 3 insertions(+), 4 deletions(-)

commit 0d9b654af1b9dbd09d3fc494d913e1401926de5e
Author: Jonathan Zacsh jzacsh@gmail.com
Date: Mon Mar 7 21:48:15 2016 -0500

ensure even in-lined <code> snippets get the whitespace the request

notes/lrm-to-pdf.sh | 1 +
1 file changed, 1 insertion(+)

commit 806cf4f0cd1a1a5fc7c982db79e64c16bd27ef60
Author: Jonathan Zacsh jzacsh@gmail.com
Date: Mon Mar 7 21:40:43 2016 -0500

another revision of the sentence that describes our multi-line equations

notes/language-reference-manual.md | 5 +++--
1 file changed, 3 insertions(+), 2 deletions(-)

commit a3dab998760e2ae874ef4cb26d4af5ffdabdb338
Author: Jonathan Zacsh jzacsh@gmail.com
Date: Mon Mar 7 21:40:11 2016 -0500

re-introduce our "shortname" of the language (we will be using it in the PDFs name, per upload instructions)

notes/language-reference-manual.md | 16 ++++++-----
1 file changed, 8 insertions(+), 8 deletions(-)

commit a9405a70050bef3eb5d5645172449f1c5d0dd22b
Author: Jonathan Zacsh jzacsh@gmail.com
Date: Mon Mar 7 21:36:39 2016 -0500

yet another correction on language of "return value" and fixed language about "multiple returns" to point out vector

notes/language-reference-manual.md | 9 +++++----
1 file changed, 5 insertions(+), 4 deletions(-)

commit dd4f4ae1e7f0b7c50001e7770b181587e787be46
Author: Jonathan Zacsh jzacsh@gmail.com
Date: Mon Mar 7 21:34:05 2016 -0500

finally got syntax highlighting working

notes/lrm-to-pdf.sh | 7 +++----
1 file changed, 3 insertions(+), 4 deletions(-)

commit 2adfeae07a0cf29e6b23ec4eb7bb36d40338fe2c
Author: Jonathan Zacsh jzacsh@gmail.com
Date: Mon Mar 7 21:17:02 2016 -0500

PDF gen fixed. now injecting our authors table automatically, and in a place that makes sense (and without our github

notes/lrm-to-pdf.sh | 103 ++++++-----
1 file changed, 59 insertions(+), 44 deletions(-)

commit 989cdc9efa25094c8b796d5a1be92961c849491b
Author: Jonathan Zacsh jzacsh@gmail.com
Date: Mon Mar 7 17:26:00 2016 -0500

untested second pass (fixing broken sed expr) to auto-inject authors into final PDF doc

README.md | 2 +-
notes/lrm-to-pdf.sh | 8 +++++---
2 files changed, 6 insertions(+), 4 deletions(-)

commit 4df7cc4cdf043bb1f3679ef9498fb9218b4dc58b
Author: Jonathan Zacsh jzacsh@gmail.com
Date: Mon Mar 7 17:22:43 2016 -0500

untested first pass to auto-inject authors into final PDF doc

notes/lrm-to-pdf.sh | 5 ++++--
1 file changed, 4 insertions(+), 1 deletion(-)

commit 13d89fa2434ec8cdf0232c57648ff38e9d093151
Author: Jonathan Zacsh jzacsh@gmail.com
Date: Mon Mar 7 17:19:31 2016 -0500

added UNIs, added full names, made totally random decisions about "roles" for the teams. i just need to be able to au

README.md | 14 ++++++-----
1 file changed, 7 insertions(+), 7 deletions(-)

commit 3c3c64933b0a1e5f6da8013f2c1ea6cd2da54f46
Author: Jonathan Zacsh jzacsh@gmail.com
Date: Mon Mar 7 17:13:56 2016 -0500

more consistency issues: tackled semi-colons missing everywhere, despite being required in our language. also in Scor

notes/language-reference-manual.md | 98 ++++++-----
1 file changed, 50 insertions(+), 48 deletions(-)

commit 3592eb1f27b95693d9e20430b6eda3cba86ba76c
Author: Jonathan Zacsh jzacsh@gmail.com
Date: Mon Mar 7 17:07:24 2016 -0500

totally unused deadcode. not sure what happened to it. i think it got lost somewhere...

notes/language-reference-manual.md | 1 -
1 file changed, 1 deletion(-)

commit 4067f9486f309af76459c3c695ef992c39b8119a
Author: Jonathan Zacsh jzacsh@gmail.com
Date: Mon Mar 7 17:06:51 2016 -0500

formatting: consistently use 2-space indentation on all code. this saves our PDFs from looking awful and having run-c

notes/language-reference-manual.md | 55 ++++++-----
1 file changed, 27 insertions(+), 28 deletions(-)

commit 27ff1269a645ffe3504713aabb72d632de36d41d
Author: Jonathan Zacsh jzacsh@gmail.com
Date: Mon Mar 7 17:06:02 2016 -0500

explain what we have an empty curly-brace block of code for

notes/language-reference-manual.md | 1 +
1 file changed, 1 insertion(+)

commit 8034a24741f592734097a916528953692f4c0055
Author: Jonathan Zacsh jzacsh@gmail.com
Date: Mon Mar 7 17:03:56 2016 -0500

yet another "function" reference that confuses concepts in our language

notes/language-reference-manual.md | 4 ++--
1 file changed, 2 insertions(+), 2 deletions(-)

commit 3988debf8e7d7bec541e0d86495cfa870223b39b
Author: Jonathan Zacsh jzacsh@gmail.com
Date: Mon Mar 7 17:03:34 2016 -0500

fix all of our incorrect references to functions. better explain what the last line of "multi-line equation" is tryir

notes/language-reference-manual.md | 17 ++++++-----
1 file changed, 9 insertions(+), 8 deletions(-)

commit 50dafde9672cef1ade16bc7d63b6a6bfec8a0bb9
Author: Jonathan Zacsh jzacsh@gmail.com
Date: Mon Mar 7 16:58:31 2016 -0500

totally forgot to talk about exponents (had a section, with an awkward blank line)

notes/language-reference-manual.md | 4 +++-
1 file changed, 3 insertions(+), 1 deletion(-)

commit 410447e4017f44a61f4b147578112d7f4aff986a
Author: Jonathan Zacsh jzacsh@gmail.com
Date: Mon Mar 7 16:55:48 2016 -0500

fix section on negation to be clear on our agreed meaning of boolean: 0 is falsy, anything else is truthy

notes/language-reference-manual.md | 6 +++---
1 file changed, 3 insertions(+), 3 deletions(-)

commit b607918979718a757382a7c90ff9e58657211532
Author: Jonathan Zacsh jzacsh@gmail.com
Date: Mon Mar 7 16:53:22 2016 -0500

noop: consistency with `expr` vs `exp` in "Expression Precedence" section

notes/language-reference-manual.md | 26 ++++++-----
1 file changed, 13 insertions(+), 13 deletions(-)

commit 76a77049767fad7e626dff42e0d5b00b965a273
Author: Jonathan Zacsh jzacsh@gmail.com
Date: Mon Mar 7 16:51:07 2016 -0500

noop: formatting: use back-ticks for code-specific prose, colon for consistency w/rest of this section

notes/language-reference-manual.md | 2 +-
1 file changed, 1 insertion(+), 1 deletion(-)

commit fc65a564987f770600ad68dcaef7ce9a6062f98b
Author: Jonathan Zacsh jzacsh@gmail.com
Date: Mon Mar 7 16:50:32 2016 -0500

deletes broken example code in `!exp` section, which does not actually logically hold

notes/language-reference-manual.md | 5 +++--
1 file changed, 3 insertions(+), 2 deletions(-)

commit 135c69ba66d4aa266122d003fd89ed829f382961
Author: Jonathan Zacsh jzacsh@gmail.com
Date: Mon Mar 7 16:49:50 2016 -0500

bug: we only have *one* type, so "negative of same type" is confusing in our language

notes/language-reference-manual.md | 2 +-
1 file changed, 1 insertion(+), 1 deletion(-)

commit a37e8394996b50708eb9339e366d38f40b2a7593
Author: Jonathan Zacsh jzacsh@gmail.com
Date: Mon Mar 7 16:48:53 2016 -0500

bug: `(expression)` description fixed. bad "eg" block, and badly-placed language about "lose their meaning"

notes/language-reference-manual.md | 9 +++-----
1 file changed, 3 insertions(+), 6 deletions(-)

commit 0c4de6ae74ee2bcfd0368856ce75e195c876bfec
Author: Jonathan Zacsh jzacsh@gmail.com
Date: Mon Mar 7 16:47:46 2016 -0500

revise language: simpler intro to "Tokens" section

notes/language-reference-manual.md | 5 ++---
1 file changed, 2 insertions(+), 3 deletions(-)

commit 3c97770092e7fd0e01c2eff6db7a248c62c402c7
Author: Jonathan Zacsh jzacsh@gmail.com
Date: Mon Mar 7 16:47:25 2016 -0500

nit: period at end of sentence

notes/language-reference-manual.md | 2 +-
1 file changed, 1 insertion(+), 1 deletion(-)

commit 8184fb4cd453f40ea15f890883b3d4a5ba19969a
Author: Jonathan Zacsh jzacsh@gmail.com
Date: Mon Mar 7 16:46:52 2016 -0500

HUGE bug (baaah, holy crap): had some awful 'C LRM' copy/pasta not applying to our language's main feature

notes/language-reference-manual.md | 9 ++++++---
1 file changed, 6 insertions(+), 3 deletions(-)

commit 7e50ecc30a9a327f6d7fc4933edeb77d16b8e5cd
Author: Jonathan Zacsh jzacsh@gmail.com
Date: Mon Mar 7 16:31:09 2016 -0500

better phrasing for the "tokens"/"lexemes" heading

notes/language-reference-manual.md | 2 +-
1 file changed, 1 insertion(+), 1 deletion(-)

commit a42eeb118af517adb9b17947e6b93e4c6cdc45f8
Author: Jonathan Zacsh jzacsh@gmail.com
Date: Mon Mar 7 15:06:12 2016 -0500

change headers to be top-level, allow PDF generator to insert non-TOC title for the document

notes/language-reference-manual.md | 52 ++++++-----
notes/lrm-to-pdf.sh | 17 ++++++-----
2 files changed, 37 insertions(+), 32 deletions(-)

commit fac67f45aae91f1e8d0d00a784455f36b4a53662
Author: Jonathan Zacsh jzacsh@gmail.com
Date: Mon Mar 7 14:12:53 2016 -0500

fix totally unreviewed regexp block. lots of mistakes/nonsensical bits and also saying "might be" is just bad news be

notes/language-reference-manual.md | 19 ++++++-----
1 file changed, 8 insertions(+), 11 deletions(-)

commit 01e680f47365bdc56e3d68592daeb78e2bf80cf3
Author: Jonathan Zacsh jzacsh@gmail.com
Date: Mon Mar 7 14:12:18 2016 -0500

add best-effort colored syntax highlighting to anything looking remotely like code, as it makes things more readable;

notes/language-reference-manual.md | 56 ++++++-----
1 file changed, 28 insertions(+), 28 deletions(-)

commit e18a80321dff9b253dab1b7680ff6e55289a75b
Author: Jonathan Zacsh jzacsh@gmail.com
Date: Mon Mar 7 14:09:08 2016 -0500

revise phrasing: fix non-sensical sentence introducing reserved keywords

notes/language-reference-manual.md | 2 +-
1 file changed, 1 insertion(+), 1 deletion(-)

commit 0698d08acd0481f7905a9c5e6732d9a9c6fba120
Author: Jonathan Zacsh jzacsh@gmail.com
Date: Mon Mar 7 14:08:37 2016 -0500

noop(readability) simplify unnecessary large code-block to in-line

notes/language-reference-manual.md | 5 +----
1 file changed, 1 insertion(+), 4 deletions(-)

commit 9518e2d56638c9840631a581b383814672af4453
Author: Jonathan Zacsh jzacsh@gmail.com
Date: Mon Mar 7 13:58:52 2016 -0500

completed all major TODOs on LRM exceptions, below

exceptions, not completed:

- "ensure we have page numbers" - not sure how to do this, and doesn't seem important enough to block on
- "ensure code snippet is colored" - too much of a pain to do, and edwards' own code snippets are never highlighted. instead just gave a background color as

- he does in his own lecture slides
- "review TODOs with TA/edwards" - in process of setting up a meeting with TA now; unfortunately couldn't meet with TA over the weekend, so our LRM's many open questions don't have much input
- "as group [...] scanners.mll" already listed as an AI elsewhere (eg: github issue)

notes/language-reference-manual.md | 24 -----
1 file changed, 24 deletions(-)

commit 535e7844e6e12c7b5db1b4c88be0dc36cce38572
Author: Jonathan Zacsh jzacsh@gmail.com
Date: Mon Mar 7 13:57:42 2016 -0500

TODO already completed by group yesterday

notes/language-reference-manual.md | 4 ++--
1 file changed, 2 insertions(+), 2 deletions(-)

commit cc6fbc5b7048b219a4f6e6039f8af92e5783a2f9
Author: Jonathan Zacsh jzacsh@gmail.com
Date: Mon Mar 7 13:57:28 2016 -0500

best-effort on PDF generation; copy of it is here: <https://drive.google.com/file/d/0B61bPXQ61mAFVvNhMmdPTktiQVk/view>

notes/language-reference-manual.md | 14 ++++++-----
1 file changed, 7 insertions(+), 7 deletions(-)

commit 41e1690b6970a6e654e00036d23c9fd9ba4081b6
Author: Jonathan Zacsh jzacsh@gmail.com
Date: Mon Mar 7 13:53:18 2016 -0500

lots of last minute inconsistency fixes to our LRM

- "ASCII" reference made slightly incorrect by our decision on string-literals
- in a PDF our long comments in code go off the page, need to wrap them manually
- snippets at bottom of doc weren't reviewed for consistency with new LRM
 - GCD example was old
 - function and function-param-list was referenced
 - semi-colons missing everywhere

notes/language-reference-manual.md | 61 ++++++-----
1 file changed, 32 insertions(+), 29 deletions(-)

commit b051b4f5e73a8fb29c4ffabbaaed086962c84db
Author: Jonathan Zacsh jzacsh@gmail.com
Date: Mon Mar 7 13:52:58 2016 -0500

last minute fixes to script to allow for hand-crafted touch-ups to LRM pdf via standard HTML webdev

notes/lrm-to-pdf.sh | 47 ++++++-----
1 file changed, 35 insertions(+), 12 deletions(-)

commit 20c24630ca78ef2c1de0f2e4602cbc93482eac07
Author: Jonathan Zacsh jzacsh@gmail.com
Date: Sun Mar 6 22:04:09 2016 -0500

noop: catch some straggler long-lines

notes/language-reference-manual.md | 49 ++++++-----
1 file changed, 33 insertions(+), 16 deletions(-)

commit 9801f986d4cfaeb00404756efaa36e4e872a924c
Author: Jonathan Zacsh jzacsh@gmail.com
Date: Sun Mar 6 22:00:22 2016 -0500

fix huge errors in our LRM: equations are statements (they have ocaml-ish unit return), gcd() is not valid syntax - v

notes/language-reference-manual.md | 17 +++++-----
1 file changed, 8 insertions(+), 9 deletions(-)

commit d2bfb05f128482e99346d4b8daf4e8847eb57f8c
Author: Jonathan Zacsh jzacsh@gmail.com
Date: Sun Mar 6 21:25:22 2016 -0500

fix definition of white-space regular expressions

notes/language-reference-manual.md | 2 +-
1 file changed, 1 insertion(+), 1 deletion(-)

commit 9530abc6951b18c577f4462264e90a00fed82949
Author: Jonathan Zacsh jzacsh@gmail.com
Date: Sun Mar 6 21:23:40 2016 -0500

more `wkhtmltopdf`-specific attempts at PDF generation with a serif font

notes/lrm-to-pdf.sh | 8 ++++++
1 file changed, 8 insertions(+)

commit 8ad3748111ca51a6e934d71aa0928a3fc474c809
Author: Jonathan Zacsh jzacsh@gmail.com
Date: Sun Mar 6 21:21:57 2016 -0500

noop: re-wrap intro on 80char columns via vim function

notes/language-reference-manual.md | 14 +++++-----
1 file changed, 7 insertions(+), 7 deletions(-)

commit 7f4d513dbf56348f0004cb620ac189af1cbe5bfe
Author: Jonathan Zacsh jzacsh@gmail.com
Date: Sun Mar 6 20:32:53 2016 -0500

[experimenting...] enable pandoc as an alternative, though it still also has its issues....

notes/lrm-to-pdf.sh | 30 ++++++-----
1 file changed, 21 insertions(+), 9 deletions(-)

commit 89de08d19c3f320fab9cc7c458b641ac8a532540
Author: Jonathan Zacsh jzacsh@gmail.com
Date: Sun Mar 6 20:13:11 2016 -0500

ensure printer margins are safe, ensure JS is running (for syntax highlighting), quiet messy `wkhtml` output

notes/lrm-to-pdf.sh | 8 ++++++-
1 file changed, 7 insertions(+), 1 deletion(-)

commit 2b661f409d0dba604711e65cd2a9c2700ff13e0c
Author: Jonathan Zacsh jzacsh@gmail.com
Date: Sun Mar 6 20:12:11 2016 -0500

do not double-inject title into PDF, ignore messy `doctoc` output

notes/lrm-to-pdf.sh | 4 ++--
1 file changed, 2 insertions(+), 2 deletions(-)

commit 318383fe03d85325c15dbcfdc2b85a4cc3c6451b
Author: Jonathan Zacsh jzacsh@gmail.com
Date: Sun Mar 6 20:11:37 2016 -0500

skip download/install of deps if unnecessary

notes/lrm-to-pdf.sh | 18 ++++++-----
1 file changed, 15 insertions(+), 3 deletions(-)

commit 174594dc987dd4c3cec45162a7135f8b72273b30
Author: Jonathan Zacsh jzacsh@gmail.com
Date: Sun Mar 6 19:48:04 2016 -0500

make it easier to auto-open PDF after building it

notes/lrm-to-pdf.sh | 2 +-
1 file changed, 1 insertion(+), 1 deletion(-)

commit fc73420b302894fea2f3bc85cf313913faca0ff4
Author: Jonathan Zacsh jzacsh@gmail.com
Date: Sun Mar 6 17:35:07 2016 -0500

more TODOs for PDF rendering

notes/language-reference-manual.md | 4 ++++
1 file changed, 4 insertions(+)

commit 731bd55ccb5e3b8ebdfef5994cb4bfa6f5640c5b
Author: Jonathan Zacsh jzacsh@gmail.com
Date: Sun Mar 6 17:32:14 2016 -0500

fixing padding

notes/lrm-to-pdf.sh | 2 +-
1 file changed, 1 insertion(+), 1 deletion(-)

commit 19961bc88aea31473d68f7f3e43bb3c4fd3cedc7
Author: Jonathan Zacsh jzacsh@gmail.com
Date: Sun Mar 6 17:30:25 2016 -0500

formatting: 80columns to avoid CSS overflow, and utilize header hierarchy of document

notes/language-reference-manual.md | 31 ++++++-----
1 file changed, 21 insertions(+), 10 deletions(-)

commit a67b898a9699ebc0df84ddc2fbc7c1520f8333
Author: Jonathan Zacsh jzacsh@gmail.com
Date: Sun Mar 6 17:24:26 2016 -0500

formatting: indent section to show it is part of "scope", removes duplication of `with statement` section

notes/language-reference-manual.md | 53 ++++++-----
1 file changed, 24 insertions(+), 29 deletions(-)

commit b47c5d60fc086b536ce0631a7a452fe68e2c3c12
Author: kekeleila lh2756@barnard.edu
Date: Mon Mar 7 06:19:54 2016 +0800

sample program

notes/language-reference-manual.md | 43 ++++++-----
1 file changed, 43 insertions(+)

commit a5a44f9a4f90fc96d88161d9b7cca7e3940ec3b3
Author: kekeleila lh2756@barnard.edu
Date: Mon Mar 7 06:12:53 2016 +0800

Update language-reference-manual.md

notes/language-reference-manual.md | 46 ++++++-----
1 file changed, 46 insertions(+)

commit cecca65400aca414c1455e205f4c7e62d2096c8f
Author: Jonathan Zacsh jzacsh@gmail.com
Date: Sun Mar 6 17:09:38 2016 -0500

add PDF-render TODOs

notes/language-reference-manual.md | 5 +++++
1 file changed, 5 insertions(+)

commit 4fc2a7fd58daf933bcf9c9ebe41628e02b37bd36
Author: kekeleila lh2756@barnard.edu
Date: Mon Mar 7 06:08:03 2016 +0800

add sample program

notes/language-reference-manual.md | 2 ++
1 file changed, 2 insertions(+)

commit 5598b439cc1807579f48fabd916eeafea5641392
Author: Jonathan Zacsh jzacsh@gmail.com
Date: Sun Mar 6 16:57:38 2016 -0500

nicer page padding

notes/lrm-to-pdf.sh | 2 +-
1 file changed, 1 insertion(+), 1 deletion(-)

commit 27096c848914277ff1718f79fbca67cbde736aa4
Author: Jonathan Zacsh jzacsh@gmail.com
Date: Sun Mar 6 16:55:52 2016 -0500

21pt font, make our doc less dense and horrible

notes/lrm-to-pdf.sh | 1 +
1 file changed, 1 insertion(+)

commit f859ca5c87a66205b9f8b87668fb876d970bc667
Author: Nam Hoang nh2110@columbia.edu
Date: Sun Mar 6 16:53:46 2016 -0500

minor fixes

notes/language-reference-manual.md | 64 ++++++-----
1 file changed, 32 insertions(+), 32 deletions(-)

commit 5542f3bb013cd97d0949cdc8c4c3e2861bfd4dd
Author: Jonathan Zacsh jzacsh@gmail.com
Date: Sun Mar 6 16:44:34 2016 -0500

do not need a second title in final PDF output

notes/lrm-to-pdf.sh | 2 +-
1 file changed, 1 insertion(+), 1 deletion(-)

commit 65502dbf434172d7a2effcdae351fba4f7c4820f
Author: Jonathan Zacsh jzacsh@gmail.com
Date: Sun Mar 6 16:38:05 2016 -0500

agreed: YES writing this as built-in, coded in C

notes/language-reference-manual.md | 2 +-
1 file changed, 1 insertion(+), 1 deletion(-)

commit c77ec5b5a70995614653a34ed7a90c45f0c58029
Author: Jonathan Zacsh jzacsh@gmail.com
Date: Sun Mar 6 16:37:05 2016 -0500

jk! moved it back

notes/language-reference-manual.md | 4 ++--
1 file changed, 2 insertions(+), 2 deletions(-)

commit 9ea9701e2b0323e9343b0cbfcf9b929e31fd9350
Author: Jonathan Zacsh jzacsh@gmail.com
Date: Sun Mar 6 16:36:17 2016 -0500

agree that vector grammar is a CFG concept, not scanner, and re-ordered it

notes/language-reference-manual.md | 4 ++--
1 file changed, 2 insertions(+), 2 deletions(-)

commit 5001753f85b95fd43d1193de5e097c7b142a530e
Author: Jonathan Zacsh jzacsh@gmail.com
Date: Sun Mar 6 16:32:58 2016 -0500

addressed todo about ASCII vs UTF8 and made note

notes/language-reference-manual.md | 5 +----
1 file changed, 1 insertion(+), 4 deletions(-)

commit 8270fff6f2e945d2588db5d003f644d1fe7fa462
Author: Jonathan Zacsh jzacsh@gmail.com
Date: Sun Mar 6 16:31:09 2016 -0500

define magical "space"

notes/language-reference-manual.md | 2 +-
1 file changed, 1 insertion(+), 1 deletion(-)

commit 7cbdfd49ed1f1b538337ae4aebd908f8fa357e09
Author: Jonathan Zacsh jzacsh@gmail.com
Date: Sun Mar 6 16:28:19 2016 -0500

noop: adds some formatting, adds some examples, removes some TODOs addressed

notes/language-reference-manual.md | 25 ++++++-----
1 file changed, 15 insertions(+), 10 deletions(-)

commit be76eb8cc17b1b381319c44b323d009e8315424a
Author: Jonathan Zacsh jzacsh@gmail.com
Date: Sun Mar 6 16:27:57 2016 -0500

removes redundant stuff in `reserved words` section

notes/language-reference-manual.md | 42 ++++-----
1 file changed, 4 insertions(+), 38 deletions(-)

commit bec5b774b76b8f88905130d18bc28af484027c65
Author: Jonathan Zacsh jzacsh@gmail.com
Date: Sun Mar 6 16:19:07 2016 -0500

mark TODOs as completed and hide them from rendering

notes/language-reference-manual.md | 40 ++-----
1 file changed, 2 insertions(+), 38 deletions(-)

commit 765f87285def9e4ecd9b0b97aafb54457d5434c6
Author: Jonathan Zacsh jzacsh@gmail.com
Date: Sun Mar 6 16:17:02 2016 -0500

reference Precedence of operators section

notes/language-reference-manual.md | 4 +++-
1 file changed, 3 insertions(+), 1 deletion(-)

commit 376bc5831a7c3fefaaa73966528c754d9f8f7854
Author: Jonathan Zacsh jzacsh@gmail.com
Date: Sun Mar 6 16:16:13 2016 -0500

mention exponents

notes/language-reference-manual.md | 2 +-
1 file changed, 1 insertion(+), 1 deletion(-)

commit a8cc3da5ef8aa2289c57ba30537c6d26642f6ac6
Author: Nam Hoang nnh2110@columbia.edu
Date: Sun Mar 6 16:08:40 2016 -0500

update statements

notes/language-reference-manual.md | 105 ++++++-----
1 file changed, 82 insertions(+), 23 deletions(-)

commit 8df4b76c729e88d5e0be7d74ee4798cd3e0818ec
Author: Jonathan Zacsh jzacsh@gmail.com
Date: Sun Mar 6 16:06:29 2016 -0500

cleans up some whitespace, adds some `backtick` formatting

notes/language-reference-manual.md | 24 ++++++-----
1 file changed, 12 insertions(+), 12 deletions(-)

commit 47363afad9919d92e4092484c0a52f00e1da57a6
Author: Jonathan Zacsh jzacsh@gmail.com
Date: Sun Mar 6 16:01:46 2016 -0500

unreverts another couple line accidentally reverted bad merge conflict 28e9398ddb69027ca2ff577

notes/language-reference-manual.md | 2 +-
1 file changed, 1 insertion(+), 1 deletion(-)

commit 28e9398ddb69027ca2ff577eeaa370028208f0d
Author: kekeleila lh2756@barnard.edu
Date: Mon Mar 7 04:42:56 2016 +0800

Declaration -- scope

notes/language-reference-manual.md | 45 ++++++-----
1 file changed, 17 insertions(+), 28 deletions(-)

commit 5b237242e820845fcb542e97776788d88476d99c
Author: Tianci Zhong tiancizhong@users.noreply.github.com
Date: Sun Mar 6 15:40:22 2016 -0500

Update language-reference-manual.md

edit list of declaration

notes/language-reference-manual.md | 15 ++++++-----
1 file changed, 10 insertions(+), 5 deletions(-)

commit 947c6f9f999d2c62e30e297de08865c20531fb7b
Author: Ruicong Xie rxie25@gmail.com
Date: Sun Mar 6 15:35:17 2016 -0500

no more integers

notes/language-reference-manual.md | 1 +
1 file changed, 1 insertion(+)

commit 17155fdb33ff012ec7bebfb1d4fb96a3edfe60e8
Author: Tianci Zhong tiancizhong@users.noreply.github.com
Date: Sun Mar 6 15:21:20 2016 -0500

Update language-reference-manual.md

edit multi-line equation

notes/language-reference-manual.md | 31 ++++++-----
1 file changed, 25 insertions(+), 6 deletions(-)

commit dd71e5501630e8fd965860dcbaba3f7ebdd5a0fa
Author: Ruicong Xie rxie25@gmail.com
Date: Sun Mar 6 15:20:39 2016 -0500

pulled

notes/language-reference-manual.md | 14 +++++-----
1 file changed, 6 insertions(+), 8 deletions(-)

commit 1a0287d60322257d1d997f8c6e4f51206347aaf6
Author: Ruicong Xie rxie25@gmail.com
Date: Sun Mar 6 15:19:27 2016 -0500

eliminated int

notes/language-reference-manual.md | 21 +++++-----
1 file changed, 10 insertions(+), 11 deletions(-)

commit ed4594b3316c7f70dacfe82ab913a90616ca1693
Author: kekeleila lh2756@barnard.edu
Date: Mon Mar 7 03:59:30 2016 +0800

Declaration -- scope

notes/language-reference-manual.md | 4 ++--
1 file changed, 2 insertions(+), 2 deletions(-)

commit 4574d803876d42dc03f04e742ed96aa450cf7b15
Author: Jonathan Zacsh jzacsh@gmail.com
Date: Sun Mar 6 14:55:52 2016 -0500

document layout hierarchy taht is easier to follow

notes/language-reference-manual.md | 6 +++--
1 file changed, 3 insertions(+), 3 deletions(-)

commit e24bb6d832e5271f12d05c66690859a99650900a
Author: Ruicong Xie rxie25@gmail.com
Date: Sun Mar 6 14:54:57 2016 -0500

added && operator

notes/language-reference-manual.md | 6 +++++-
1 file changed, 5 insertions(+), 1 deletion(-)

commit 9f6fc7c91334a3dd9626afeb65cca12f300d6e5b
Author: Ruicong Xie rxie25@gmail.com
Date: Sun Mar 6 14:49:11 2016 -0500

moved Precedence of Expressions to build-ins

notes/language-reference-manual.md | 2 +-
1 file changed, 1 insertion(+), 1 deletion(-)

commit d53961504f2a6a2519cdb01ce1dd81c3db947656
Author: Ruicong Xie rxie25@gmail.com
Date: Sun Mar 6 14:47:22 2016 -0500

moved Precedence of Expressions to build-ins

notes/language-reference-manual.md | 131 ++++++-----
1 file changed, 62 insertions(+), 69 deletions(-)

commit 6ea2815c9a22b4bc4b98722e2d9f19b2b71e50a2
Author: Nam Hoang nh2110@columbia.edu
Date: Sun Mar 6 14:46:56 2016 -0500

update TODOs

notes/language-reference-manual.md | 18 ++++++-----
1 file changed, 8 insertions(+), 10 deletions(-)

commit 07f882b6930798bf17ed781d681285902a619677
Author: Tianci Zhong tiancizhong@users.noreply.github.com
Date: Sun Mar 6 14:42:54 2016 -0500

Update language-reference-manual.md

notes/language-reference-manual.md | 6 +++++-
1 file changed, 5 insertions(+), 1 deletion(-)

commit 945fb2103d68a699cc0b10007c20af0e4c916344
Author: Jonathan Zacsh jzacsh@gmail.com
Date: Sun Mar 6 13:06:52 2016 -0500

noop: cleans up "Precedence of Expressions" section of LRM for plain-text readability, and fixes some markdown format

notes/language-reference-manual.md | 57 ++++++-----
1 file changed, 41 insertions(+), 16 deletions(-)

commit b48d16892b01fd57874454d20b0ac3e1b5166681
Author: Jonathan Zacsh jzacsh@gmail.com
Date: Sun Mar 6 13:04:07 2016 -0500

noop: cleans up "Declarations" section of LRM for plain-text readability, and fixes some markdown formatting

notes/language-reference-manual.md | 48 ++++++-----
1 file changed, 35 insertions(+), 13 deletions(-)

commit 8d3b915d23d2ef180973434e3c98b018c902008a
Author: Jonathan Zacsh jzacsh@gmail.com
Date: Sun Mar 6 12:59:19 2016 -0500

design-impl.: revise intro sentence detailing "other" expressions we may see

notes/language-reference-manual.md | 6 +++---
1 file changed, 3 insertions(+), 3 deletions(-)

commit ad0a86cd54d84c14e82dd442d92c6eaba7944a0f
Author: Jonathan Zacsh jzacsh@gmail.com
Date: Sun Mar 6 12:57:49 2016 -0500

context vs find: revise the less-contrived example's sentence.

notes/language-reference-manual.md | 7 +++---
1 file changed, 4 insertions(+), 3 deletions(-)

commit f4b3ae820c5abc5cd0ebffac33ae7ba3f3463ecb
Author: Jonathan Zacsh jzacsh@gmail.com
Date: Sun Mar 6 12:55:55 2016 -0500

intro to lexemes/tokens; revise sentence for clarity

notes/language-reference-manual.md | 6 +++---
1 file changed, 3 insertions(+), 3 deletions(-)

commit 1d47485600a91e6ab8f1374f7f47876a2041344a
Author: Jonathan Zacsh jzacsh@gmail.com
Date: Sun Mar 6 12:26:37 2016 -0500

center our PDFs title

notes/lrm-to-pdf.sh | 1 +
1 file changed, 1 insertion(+)

commit ade0524743bb4bdf9a170f4d3cd8b488c292ea5d
Author: Jonathan Zacsh jzacsh@gmail.com
Date: Sun Mar 6 12:23:35 2016 -0500

fixed PDF generator; trying to get syntax highlighting working

notes/lrm-to-pdf.sh | 45 ++++++-----
1 file changed, 38 insertions(+), 7 deletions(-)

commit 9089875243aa821fb5d7508bd66919ae9f60ac07
Author: Jonathan Zacsh jzacsh@gmail.com
Date: Sun Mar 6 11:20:33 2016 -0500

[untested] quick script to generate PDF from our markdown, and include table of contents

notes/lrm-to-pdf.sh | 28 ++++++
1 file changed, 28 insertions(+)

commit 51931e59c744777f9822c98b00f4feca10fed02d
Author: Jonathan Zacsh jzacsh@gmail.com
Date: Sat Mar 5 23:06:26 2016 -0500

reworded/revisd first major section, "Design Implementation"

- was all over the place with:
- lots of repetition
- out of order
- added a ton of `TODO`s for us to address as a group

notes/language-reference-manual.md | 165 ++++++-----
1 file changed, 88 insertions(+), 77 deletions(-)

commit 135f7d93928d6efab070f9656fc32c69125eea22
Author: Jonathan Zacsh jzacsh@gmail.com
Date: Sat Mar 5 19:26:39 2016 -0500

better explain strange LRM's jump into bulleted list

notes/language-reference-manual.md | 6 +++++-
1 file changed, 5 insertions(+), 1 deletion(-)

commit 96af9b82d3bf8654f36a321dcd51e09b161d7600
Author: Jonathan Zacsh jzacsh@gmail.com
Date: Sat Mar 5 19:12:58 2016 -0500

clarifies `find` vs "context" and cleans up intro

tries to make better formal definition of "what's a program" section
- clarifies the *purpose* in `find` vs. "context"
- shows the `hello world` earlier.

notes/language-reference-manual.md | 35 ++++++-----
1 file changed, 22 insertions(+), 13 deletions(-)

commit 3f4d00f9b6bf9f2ea6034add743a73b22e5c20a3
Author: Jonathan Zacsh jzacsh@gmail.com
Date: Sat Mar 5 18:48:14 2016 -0500

use 'x' for nam's TODOs so they look done in github flavored markdown

notes/language-reference-manual.md | 6 +++---
1 file changed, 3 insertions(+), 3 deletions(-)

commit 6e89933e6a28acd20688fba2388a784e04f59677

Author: Jonathan Zacsh jzacsh@gmail.com

Date: Sat Mar 5 18:45:39 2016 -0500

rephrase for simpler titles of intro

- mark "target"-section's port as complete
- splits existing "what is a program" in 1/2 to show a "hello world"

notes/language-reference-manual.md | 34 ++++++-----
1 file changed, 25 insertions(+), 9 deletions(-)

commit f9a95887a814f090b960f04bb375e3d8c08a56f8

Author: Nam Hoang nh2110@columbia.edu

Date: Sat Mar 5 18:32:06 2016 -0500

write builtin functions

notes/language-reference-manual.md | 37 ++++++-----
1 file changed, 34 insertions(+), 3 deletions(-)

commit b8ff5d00f80d370469787519fbb6179af241d808

Author: Nam Hoang nh2110@columbia.edu

Date: Sat Mar 5 18:01:13 2016 -0500

clean things up & add todos

notes/language-reference-manual.md | 31 ++++++-----
1 file changed, 12 insertions(+), 19 deletions(-)

commit c5ccf2f6381cbd5189b58e74291110b928409403

Author: Nam Hoang nh2110@columbia.edu

Date: Sat Mar 5 17:53:51 2016 -0500

explain some more statements

notes/language-reference-manual.md | 91 ++++++-----
1 file changed, 37 insertions(+), 54 deletions(-)

commit d2bcab3e4705664eb3fe9c9f2b9315c08ba330ed

Author: Nam Hoang nh2110@columbia.edu

Date: Sat Mar 5 17:33:01 2016 -0500

created statements section

notes/language-reference-manual.md | 120 ++++++-----
1 file changed, 108 insertions(+), 12 deletions(-)

commit 766abe4336ffc0cad44fa474a53d4b9db90167e3

Author: Jonathan Zacsh jzacsh@gmail.com

Date: Sat Mar 5 08:33:18 2016 -0500

readme: no longer true that we meet with our TA weekly

README.md | 4 ----

1 file changed, 4 deletions(-)

commit 65e0339e0409b0b54975eaf11422b198071b443f
Author: Tianci Zhong tiancizhong@users.noreply.github.com
Date: Fri Mar 4 16:21:08 2016 -0500

Update language-reference-manual.md

notes/language-reference-manual.md | 8 ++++----
1 file changed, 4 insertions(+), 4 deletions(-)

commit cf7fef98262fe92c888dd09672b81929a5fdc561
Author: Tianci Zhong tiancizhong@users.noreply.github.com
Date: Fri Mar 4 16:18:52 2016 -0500

Update language-reference-manual.md

notes/language-reference-manual.md | 8 ++++++---
1 file changed, 5 insertions(+), 3 deletions(-)

commit fb6617506a879c559cff771c133d90227fe27df7
Author: kekeleila lh2756@barnard.edu
Date: Sat Mar 5 01:37:22 2016 +0800

Update language-reference-manual.md

notes/language-reference-manual.md | 4 ++++
1 file changed, 4 insertions(+)

commit ac3f6cbd484d56f240d3f22a49837c8562569a24
Author: kekeleila lh2756@barnard.edu
Date: Sat Mar 5 01:36:10 2016 +0800

Declaration--equations & Scope

notes/language-reference-manual.md | 13 ++++++++-----
1 file changed, 8 insertions(+), 5 deletions(-)

commit a243fd7071c50f8f7531bbc234284abfd8a65924
Author: kekeleila lh2756@barnard.edu
Date: Sat Mar 5 01:24:51 2016 +0800

Declaration--equations

notes/language-reference-manual.md | 11 ++++++++--
1 file changed, 9 insertions(+), 2 deletions(-)

commit 0645934a4c676b7c6d10dc5a69017fba100e8120
Author: Jonathan Zacsh jzacsh@gmail.com
Date: Thu Mar 3 23:10:42 2016 -0500

update our intro to clarify the new numeric-analysis approach we've settled on w/professor

notes/language-reference-manual.md | 26 ++++++++-----
1 file changed, 11 insertions(+), 15 deletions(-)

commit e1e305ec3d105f2a1768d48fbd666bfe18c3aa3
Author: Jonathan Zacsh jzacsh@gmail.com
Date: Thu Mar 3 23:04:19 2016 -0500

capitalizes scope names to be consistent with elsewhere in document; also noop: whitespace/microsoft-carr-return clea

notes/language-reference-manual.md | 49 ++++++-----
1 file changed, 37 insertions(+), 12 deletions(-)

commit 62d3adfa7a09846ab8d2fb0490967e9ab261f5ca
Author: Jonathan Zacsh jzacsh@gmail.com
Date: Thu Mar 3 22:58:56 2016 -0500

started on my task: importing old LRM's content and spelled out TODO list for myself

notes/language-reference-manual.md | 59 ++++++-----
1 file changed, 48 insertions(+), 11 deletions(-)

commit 161a3bc1a89ebd9a401cc6d5015d6ebd7fc869b9
Author: Jonathan Zacsh jzacsh@gmail.com
Date: Thu Mar 3 22:49:17 2016 -0500

link to LRM, update old long lin

README.md | 2 +-
notes/language-reference-manual.md | 2 +-
2 files changed, 2 insertions(+), 2 deletions(-)

commit 9aec5e526d31a601ffda2f5f61238355ce1338a
Author: Jonathan Zacsh jzacsh@gmail.com
Date: Thu Mar 3 22:46:51 2016 -0500

noop(markdown) inversed link syntax

notes/language-reference-manual.md | 2 +-
1 file changed, 1 insertion(+), 1 deletion(-)

commit 01f79a8869c4525138ac21df369a9add9684b2dc
Author: Ruicong Xie rxie25@gmail.com
Date: Thu Mar 3 22:39:03 2016 -0500

keyword meaning was not updated

notes/language-reference-manual.md | 8 +++++--
1 file changed, 5 insertions(+), 3 deletions(-)

commit c6505b8c904f91209e494f22a8f0ce7007a7ae68
Author: Jonathan Zacsh jzacsh@gmail.com
Date: Thu Mar 3 22:37:50 2016 -0500

explain the magic of `find` expressions `with` vector assignments

notes/language-reference-manual.md | 10 ++++++--
1 file changed, 8 insertions(+), 2 deletions(-)

commit 849a218c0bf33c69b1378cafa3901c4addb30391
Author: Jonathan Zacsh jzacsh@gmail.com
Date: Thu Mar 3 22:35:25 2016 -0500

oops, called an example context a reserved word

notes/language-reference-manual.md | 2 +-
1 file changed, 1 insertion(+), 1 deletion(-)

commit e870e1a575d9324ce4567b6ced0e33ea339bdd4f
Author: Tianci Zhong tz2278@columbia.edu
Date: Thu Mar 3 22:34:05 2016 -0500

modified declaration

notes/language-reference-manual.md | 2 +-
1 file changed, 1 insertion(+), 1 deletion(-)

commit 9563d8e0cddeea67a3bb132c2898c3c6ecec9f9
Author: Tianci Zhong tz2278@columbia.edu
Date: Thu Mar 3 22:24:54 2016 -0500

modified declaration

notes/language-reference-manual.md | 2 +-
1 file changed, 1 insertion(+), 1 deletion(-)

commit 784f5d5741a521c710f87b0b4b89e317650860a2
Author: Tianci Zhong tz2278@columbia.edu
Date: Thu Mar 3 22:16:34 2016 -0500

modify declaration

notes/language-reference-manual.md | 46 ++++++-----
1 file changed, 17 insertions(+), 29 deletions(-)

commit 7fc3194e85d85757eb92d2ce7e8e04a1f93dca0b
Author: Jonathan Zacsh jzacsh@gmail.com
Date: Thu Mar 3 22:05:03 2016 -0500

nit: removes question mark probably inserted by accident during group session

notes/language-reference-manual.md | 2 +-
1 file changed, 1 insertion(+), 1 deletion(-)

commit e8bf583f82db285d283f7c1709ed9d4987f7a94b
Author: Jonathan Zacsh jzacsh@gmail.com
Date: Thu Mar 3 22:04:04 2016 -0500

oops: last commit broke some formatting it was trying to fix. fixed here

notes/language-reference-manual.md | 30 ++++++-----
1 file changed, 23 insertions(+), 7 deletions(-)

commit c5fa34219e8698a83d8b7dd9894a7a0bc51e483
Author: Jonathan Zacsh jzacsh@gmail.com
Date: Thu Mar 3 21:58:12 2016 -0500

formatting: strip windows carriage returns, fix some github formatting (extra line-break after bullets' declaration i

notes/language-reference-manual.md | 34 ++++++-----
1 file changed, 21 insertions(+), 13 deletions(-)

commit 986e3218a9e4317c8284e58aa58d19f780344e4c
Author: Ruicong Xie rxie25@gmail.com
Date: Thu Mar 3 21:45:24 2016 -0500

updated more keyword meaning

notes/language-reference-manual.md | 12 ++++++----
1 file changed, 8 insertions(+), 4 deletions(-)

commit 05ca2d045ed1582e2050dec07c07b5ea28be4aab
Author: Ruicong Xie rxie25@gmail.com
Date: Thu Mar 3 21:16:03 2016 -0500

updated keyword meanings

notes/language-reference-manual.md | 34 ++++++-----
1 file changed, 23 insertions(+), 11 deletions(-)

commit 5d2a7fd1dadc51f0a6e5324d255c17b05e56cc7a
Author: Tianci Zhong tz2278@columbia.edu
Date: Thu Mar 3 20:34:10 2016 -0500

format

notes/language-reference-manual.md | 16 ++++++-----
1 file changed, 10 insertions(+), 6 deletions(-)

commit bf198a408479c04d53b9f83746e8bf893b8906bb
Author: Tianci Zhong tz2278@columbia.edu
Date: Thu Mar 3 20:18:50 2016 -0500

format

notes/language-reference-manual.md | 16 ++++++-----
1 file changed, 10 insertions(+), 6 deletions(-)

commit d90a642e45411e5e51ff1186228706670f6cd44c
Author: Tianci Zhong tz2278@columbia.edu
Date: Thu Mar 3 20:13:23 2016 -0500

add declaration

notes/language-reference-manual.md | 14 ++++++-----
1 file changed, 13 insertions(+), 1 deletion(-)

commit 80560717c30ef2c286235f1dc852048715745f59
Author: Jonathan Zacsh jzacsh@gmail.com
Date: Thu Mar 3 14:27:44 2016 -0500

assignments!

notes/language-reference-manual.md | 15 ++++++-----
1 file changed, 8 insertions(+), 7 deletions(-)

commit c1905db6c4cfea6ec76afb9fe56f23b85122526b
Author: Jonathan Zacsh jzacsh@gmail.com
Date: Thu Mar 3 14:21:21 2016 -0500

whitespace cleanup

notes/language-reference-manual.md | 2 +-
1 file changed, 1 insertion(+), 1 deletion(-)

commit 5ff42a3dc6ae87c535f9d4cda1b3693510c9385b
Author: Jonathan Zacsh jzacsh@gmail.com
Date: Thu Mar 3 14:21:11 2016 -0500

accidentally stole some of jimmy's work

notes/language-reference-manual.md | 24 ++++++-----
1 file changed, 9 insertions(+), 15 deletions(-)

commit ecba283d5b0d711e3290320c52e3e373b621a082
Author: Jonathan Zacsh jzacsh@gmail.com
Date: Thu Mar 3 14:20:48 2016 -0500

started expanding reserved words

notes/language-reference-manual.md | 36 ++++++-----
1 file changed, 33 insertions(+), 3 deletions(-)

commit fbc663a7111d8d70a0a09a261e2340803566723c
Author: Jonathan Zacsh jzacsh@gmail.com
Date: Thu Mar 3 14:20:02 2016 -0500

TODOs expanded with group, with some assignments

notes/language-reference-manual.md | 16 ++++++-----
1 file changed, 10 insertions(+), 6 deletions(-)

commit b397b18fa271d17d7366a61e4e4aff9d5a7b1469
Author: Jonathan Zacsh jzacsh@gmail.com
Date: Thu Mar 3 13:52:32 2016 -0500

expanding on some reserved keywords

notes/language-reference-manual.md | 37 ++++++-----
1 file changed, 29 insertions(+), 8 deletions(-)

commit 79ec82fa7d4cb9e5614d0a1a8560fc2c06d66f47
Author: Jonathan Zacsh jzacsh@gmail.com
Date: Thu Mar 3 13:34:28 2016 -0500

clarify TODOs left in this doc

notes/language-reference-manual.md | 9 ++++++--
1 file changed, 8 insertions(+), 1 deletion(-)

commit f92406a5db77f0de9a7fe76cb62e1b4c8d702f1b
Author: Jonathan Zacsh jzacsh@gmail.com
Date: Thu Mar 3 13:26:28 2016 -0500

clarified order of precedence, inspired by C LRM

notes/language-reference-manual.md | 14 ++++-----
1 file changed, 4 insertions(+), 10 deletions(-)

commit 2ab877de073295345265aacde5d097f2c685f5fa
Author: Jonathan Zacsh jzacsh@gmail.com
Date: Thu Mar 3 13:16:11 2016 -0500

first-pass at order of precedence on expressions

notes/language-reference-manual.md | 49 ++++++-----
1 file changed, 48 insertions(+), 1 deletion(-)

commit ff4984373b1297e6bf9c9c6eb1903c6db1213c06
Author: Jonathan Zacsh jzacsh@gmail.com
Date: Thu Mar 3 12:21:18 2016 -0500

copy/pasta typo

notes/language-reference-manual.md | 2 --
1 file changed, 2 deletions(-)

commit 3b6a1852946fca75f2ea67d1486c2407a105fa95
Author: Jonathan Zacsh jzacsh@gmail.com
Date: Thu Mar 3 12:20:06 2016 -0500

quick pass at strings regexp

group commit

notes/language-reference-manual.md | 26 ++++++-----
1 file changed, 24 insertions(+), 2 deletions(-)

commit d89be5d0896d78c96349131d8ee3ba05c995ddd1
Author: Jonathan Zacsh jzacsh@gmail.com
Date: Wed Mar 2 19:09:39 2016 -0500

noop(github markdown magic) make "eg" lines sit as indented content

notes/language-reference-manual.md | 3 +++
1 file changed, 3 insertions(+)

commit 6a79c34178cedba11a292c4b9d2c54e3bee58fd8
Author: Jonathan Zacsh jzacsh@gmail.com
Date: Wed Mar 2 19:07:54 2016 -0500

gave a first pass at what our regular expressions might look like to identify lexemes via `ocamllex` ... more Data Ty

notes/language-reference-manual.md | 35 ++++++-----
1 file changed, 32 insertions(+), 3 deletions(-)

commit 441975dfec4350cc623663dcb7d0c9ec9848bdd5
Author: Jonathan Zacsh jzacsh@gmail.com
Date: Wed Mar 2 18:56:45 2016 -0500

(readability) "what is a program" split in 2 p.graphs

notes/language-reference-manual.md | 10 +++++----
1 file changed, 6 insertions(+), 4 deletions(-)

commit 9f1cde2c447660d012e66ecb4c8aaadc2f152765
Author: Jonathan Zacsh jzacsh@gmail.com
Date: Wed Mar 2 18:49:55 2016 -0500

brainstorm/scratchpad to start scanner/parser

rough notes we may/may not use in actual Language Reference Manual. Notes added in this commit merely flesh out what we've discussed and shown in our existing LRM's ["example snippet"] (<https://goo.gl/VJcW5Z#heading=h.atk37uw9hui7>)

notes/language-reference-manual.md | 46 ++++++-----
1 file changed, 46 insertions(+)

commit 30177b60d86ed648aa95e67bde488e2af268beb9
Author: Jonathan Zacsh jzacsh@gmail.com
Date: Mon Feb 29 16:06:58 2016 -0500

documenting our weekly meeting time with our group TA

README.md | 4 ++++
1 file changed, 4 insertions(+)

commit 9548a4a4d2d7975fc6bff23a2d912ebba3bd4ddd
Author: Jonathan Zacsh jzacsh@gmail.com
Date: Wed Feb 24 21:55:15 2016 +0000

(#3 noop docs) fix typo in title and cleanup some things that should be quoted

src/README.md | 6 +++---
1 file changed, 3 insertions(+), 3 deletions(-)

commit a9a2a1c044b0b66eed975545e7f7eb20512d8159
Author: Jonathan Zacsh jzacsh@gmail.com
Date: Wed Feb 24 21:52:53 2016 +0000

(#3 docs) updates README to address our language, rather than the MicroC compiler we are forking from

src/README.md | 9 +++++----

1 file changed, 5 insertions(+), 4 deletions(-)

commit 3921921a4da1efe5727eb71d20df890ad891b9be
Author: Jonathan Zacsh jzacsh@gmail.com
Date: Wed Feb 24 21:46:56 2016 +0000

split README in half: a one-time-only INSTALL file, and the rest left over in README.md, as-is (still not specific to

src/INSTALL | 168 +++++
src/README | 184 -----
src/README.md | 28 +++++
3 files changed, 196 insertions(+), 184 deletions(-)

commit f76dd22cf0ab80dbf6bea3b94a0fb07601601c1a
Author: Jonathan Zacsh jzacsh@gmail.com
Date: Wed Feb 24 21:24:21 2016 +0000

'test' Make target, per sedwards' README, basic steps are: make && ./testall.sh (which is implicitly 'microc.native')

src/.gitignore | 1 +
src/Makefile | 4 ++++
2 files changed, 5 insertions(+)

commit dcebdcf144a12db1535379f8ce6a6a3796b64d3d
Author: Jonathan Zacsh jzacsh@gmail.com
Date: Wed Feb 24 21:19:05 2016 +0000

forking sedwards@' MicroC compiler to start

Downloaded from
<http://www.cs.columbia.edu/~sedwards/classes/2016/4115-spring/microc-llvm.tar.gz>
as is, without changes, on 20160224 at 21:17.

src/Makefile | 78 +++++
src/README | 184 +++++
src/ast.ml | 103 +++++
src/codegen.ml | 183 +++++
src/microc.ml | 20 +++++
src/parser.mly | 115 +++++
src/scanner.mll | 45 +++++
src/semant.ml | 158 +++++
src/testall.sh | 184 +++++
src/tests/fail-assign1.err | 1 +
src/tests/fail-assign1.mc | 11 +++
src/tests/fail-assign2.err | 1 +
src/tests/fail-assign2.mc | 7 ++
src/tests/fail-assign3.err | 1 +
src/tests/fail-assign3.mc | 11 +++
src/tests/fail-dead1.err | 1 +
src/tests/fail-dead1.mc | 8 ++
src/tests/fail-dead2.err | 1 +
src/tests/fail-dead2.mc | 10 +++
src/tests/fail-expr1.err | 1 +
src/tests/fail-expr1.mc | 18 +++++
src/tests/fail-expr2.err | 1 +
src/tests/fail-expr2.mc | 14 +++++
src/tests/fail-for1.err | 1 +
src/tests/fail-for1.mc | 13 +++++
src/tests/fail-for2.err | 1 +
src/tests/fail-for2.mc | 8 ++

```
src/tests/fail-for3.err | 1 +
src/tests/fail-for3.mc | 8 ++
src/tests/fail-for4.err | 1 +
src/tests/fail-for4.mc | 8 ++
src/tests/fail-for5.err | 1 +
src/tests/fail-for5.mc | 10 +++
src/tests/fail-func1.err | 1 +
src/tests/fail-func1.mc | 12 +++
src/tests/fail-func2.err | 1 +
src/tests/fail-func2.mc | 8 ++
src/tests/fail-func3.err | 1 +
src/tests/fail-func3.mc | 8 ++
src/tests/fail-func4.err | 1 +
src/tests/fail-func4.mc | 12 +++
src/tests/fail-func5.err | 1 +
src/tests/fail-func5.mc | 14 ++++
src/tests/fail-func6.err | 1 +
src/tests/fail-func6.mc | 9 +++
src/tests/fail-func7.err | 1 +
src/tests/fail-func7.mc | 9 +++
src/tests/fail-func8.err | 1 +
src/tests/fail-func8.mc | 13 ++++
src/tests/fail-func9.err | 1 +
src/tests/fail-func9.mc | 9 +++
src/tests/fail-global1.err | 1 +
src/tests/fail-global1.mc | 9 +++
src/tests/fail-global2.err | 1 +
src/tests/fail-global2.mc | 9 +++
src/tests/fail-if1.err | 1 +
src/tests/fail-if1.mc | 6 ++
src/tests/fail-if2.err | 1 +
src/tests/fail-if2.mc | 6 ++
src/tests/fail-if3.err | 1 +
src/tests/fail-if3.mc | 8 ++
src/tests/fail-nomain.err | 1 +
src/tests/fail-nomain.mc | 0
src/tests/fail-return1.err | 1 +
src/tests/fail-return1.mc | 4 +
src/tests/fail-return2.err | 1 +
src/tests/fail-return2.mc | 10 +++
src/tests/fail-while1.err | 1 +
src/tests/fail-while1.mc | 13 ++++
src/tests/fail-while2.err | 1 +
src/tests/fail-while2.mc | 13 ++++
src/tests/test-add1.mc | 10 +++
src/tests/test-add1.out | 1 +
src/tests/test-arith1.mc | 5 ++
src/tests/test-arith1.out | 1 +
src/tests/test-arith2.mc | 5 ++
src/tests/test-arith2.out | 1 +
src/tests/test-arith3.mc | 13 ++++
src/tests/test-arith3.out | 1 +
src/tests/test-fib.mc | 16 ++++
src/tests/test-fib.out | 6 ++
src/tests/test-for1.mc | 9 +++
src/tests/test-for1.out | 6 ++
src/tests/test-for2.mc | 11 +++
src/tests/test-for2.out | 6 ++
src/tests/test-func1.mc | 12 +++
src/tests/test-func1.out | 1 +
src/tests/test-func2.mc | 18 ++++
src/tests/test-func2.out | 1 +
src/tests/test-func3.mc | 13 ++++
src/tests/test-func3.out | 4 +
```

src/tests/test-func4.mc | 14 ++++
src/tests/test-func4.out | 1 +
src/tests/test-func5.mc | 9 +++
src/tests/test-func5.out | 0
src/tests/test-func6.mc | 9 +++
src/tests/test-func6.out | 1 +
src/tests/test-func7.mc | 13 ++++
src/tests/test-func7.out | 1 +
src/tests/test-func8.mc | 10 +++
src/tests/test-func8.out | 1 +
src/tests/test-gcd.mc | 15 ++++
src/tests/test-gcd.out | 3 +
src/tests/test-gcd2.mc | 14 ++++
src/tests/test-gcd2.out | 3 +
src/tests/test-global1.mc | 30 +++++++
src/tests/test-global1.out | 4 +
src/tests/test-global2.mc | 10 +++
src/tests/test-global2.out | 1 +
src/tests/test-global3.mc | 11 +++
src/tests/test-global3.out | 1 +
src/tests/test-hello.mc | 7 ++
src/tests/test-hello.out | 3 +
src/tests/test-if1.mc | 6 ++
src/tests/test-if1.out | 2 +
src/tests/test-if2.mc | 6 ++
src/tests/test-if2.out | 2 +
src/tests/test-if3.mc | 6 ++
src/tests/test-if3.out | 1 +
src/tests/test-if4.mc | 6 ++
src/tests/test-if4.out | 2 +
src/tests/test-if5.mc | 16 ++++
src/tests/test-if5.out | 2 +
src/tests/test-local1.mc | 13 ++++
src/tests/test-local1.out | 1 +
src/tests/test-local2.mc | 14 ++++
src/tests/test-local2.out | 1 +
src/tests/test-ops1.mc | 28 +++++++
src/tests/test-ops1.out | 24 ++++++
src/tests/test-ops2.mc | 17 ++++
src/tests/test-ops2.out | 14 ++++
src/tests/test-var1.mc | 7 ++
src/tests/test-var1.out | 1 +
src/tests/test-var2.mc | 13 ++++
src/tests/test-var2.out | 1 +
src/tests/test-while1.mc | 11 +++
src/tests/test-while1.out | 6 ++
src/tests/test-while2.mc | 16 ++++
src/tests/test-while2.out | 1 +
139 files changed, 1917 insertions(+)

commit 101230e7b47a3bacd8594799ddfa9c5881fad954
Author: Jonathan Zacsh jzacsh@gmail.com
Date: Wed Feb 24 16:11:19 2016 -0500

`noop(doc)` link to github accts

README.md | 10 +++++-----
1 file changed, 5 insertions(+), 5 deletions(-)

commit 05da97466919d91800ef2650467382d665feeb1f
Author: Jonathan Zacsh jzacsh@gmail.com
Date: Wed Feb 24 19:38:13 2016 +0000

noop(doc) fixing typo in link "when to meet" graph

README.md | 2 +-
1 file changed, 1 insertion(+), 1 deletion(-)

commit ad320800647ec5909c7332e02a620837c4d29ea4
Author: Jonathan Zacsh jzacsh@gmail.com
Date: Wed Feb 24 19:36:42 2016 +0000

noop(docs) moving over some helpful info from our "brainstorm" doc, and sharing links to our Drive folder and files

README.md | 20 ++++++-----
1 file changed, 16 insertions(+), 4 deletions(-)

commit c6a85c6ff51b197695309ec3c7976cc1cf55d578
Author: Jonathan Zacsh jzacsh@gmail.com
Date: Wed Feb 24 19:10:30 2016 +0000

rm obsolete example snippet no longer relevant since we have settled on an outline for our language

SpringBall.c | 41 -----
1 file changed, 41 deletions(-)

commit 1e3c7c284276d085c85ee622efd07d0f6e02b10
Author: Jonathan Zacsh jzacsh@gmail.com
Date: Wed Feb 24 17:44:54 2016 +0000

noop: recommended gitignore for Ocaml, pulled from github.com/github/gitignore/blob/044d46a0c487/Ocaml.gitignore

.gitignore | 20 ++++++
1 file changed, 20 insertions(+)

commit 1a16d853e0c90e3994e565479f5239ab6f567746
Author: Jonathan Zacsh jzacsh@gmail.com
Date: Wed Feb 24 17:43:13 2016 +0000

sharing my meeting notes with rest of the group (much has chnaged since these notes were taken, so mind their date)

notes/20160215_first-ta-meeting_project.md | 32 ++++++
1 file changed, 32 insertions(+)

commit fc8a0c50bf062939c4df3d27e5f4dca452eb820a
Author: Ruicong Xie rxie25@gmail.com
Date: Tue Feb 2 01:50:54 2016 -0500

simple spring ball simulation in C

SpringBall.c | 41 ++++++
1 file changed, 41 insertions(+)

commit 7e945cd6eb972adc9b250140670bb1beb4490700
Author: Ruicong Xie rxie25@gmail.com
Date: Mon Jan 25 18:39:48 2016 -0500

test

src/test | 0

1 file changed, 0 insertions(+), 0 deletions(-)

commit cc9d081764180e61a9e58d2c9063bb0ddb887c23

Author: Ruicong Xie rxie25@gmail.com

Date: Mon Jan 25 18:36:00 2016 -0500

test

src/test | 0

1 file changed, 0 insertions(+), 0 deletions(-)

commit 207aa2581965bdf09c2d639ca7cf3e3a3ad42a53

Author: Tianci Zhong tz2278@columbia.edu

Date: Mon Jan 25 17:46:30 2016 -0500

test

README.md | 1 +

1 file changed, 1 insertion(+)

commit d073a722c56d68309e01c14d6fb49051435f802a

Author: Tianci Zhong tz2278@columbia.edu

Date: Mon Jan 25 17:41:40 2016 -0500

test

README.md | 1 +

1 file changed, 1 insertion(+)

commit fbc5c4042cb0f5855afd360679231f0ba29ddaa4

Author: Jimmy Xie rxie25@gmail.com

Date: Mon Jan 25 17:20:40 2016 -0500

slack test

test slack

README.md | 2 ++

1 file changed, 2 insertions(+)

commit 670b2d7daec351d5043df12da1e4b696d3c034c6

Author: Jimmy Xie rxie25@gmail.com

Date: Mon Jan 25 16:53:01 2016 -0500

Update README.md

README.md | 1 +

1 file changed, 1 insertion(+)

commit 27ab997187ab0b20d737a92bf04b6ca1fc2da890

Author: Jimmy Xie rxie25@gmail.com

Date: Mon Jan 25 16:52:35 2016 -0500

Update README.md

README.md | 1 -
1 file changed, 1 deletion(-)

commit f08240ae6516e0acff5b320fc9673607597e4b68
Author: Jimmy Xie rxie25@gmail.com
Date: Mon Jan 25 16:52:23 2016 -0500

Update README.md

README.md | 3 ++-
1 file changed, 2 insertions(+), 1 deletion(-)

commit c71eaf508e83e570c66a0a280327e60d1db0fa5e
Author: Jimmy Xie rxie25@gmail.com
Date: Mon Jan 25 16:50:34 2016 -0500

Update README.md

README.md | 2 +-
1 file changed, 1 insertion(+), 1 deletion(-)

commit 6612013327879a443c838bf85f0827ee36ee8908
Author: Jimmy Xie rxie25@gmail.com
Date: Mon Jan 25 16:50:11 2016 -0500

Update README.md

README.md | 1 +
1 file changed, 1 insertion(+)

commit 4ca07dbbddd9c8eab8eff42209d826cc354e93c
Author: Jimmy Xie rxie25@gmail.com
Date: Mon Jan 25 16:49:20 2016 -0500

Initial commit

README.md | 2 ++
1 file changed, 2 insertions(+)
``

```

    Neg -> "-"
  | Not -> "!"
  | Abs -> "|"

let rec string_of_expr = function
  Strlit(l) -> l
  | Literal(l) -> string_of_float l
  | Id(s) -> s
  | Binop(e1, o, e2) ->
    string_of_expr e1 ^ " " ^ string_of_op o ^ " " ^ string_of_expr e2
  | Unop(o, e) -> string_of_uop o ^ string_of_expr e
  | Assign(v, e) -> v ^ " = " ^ string_of_expr e
  | Builtin(f, el) ->
    f ^ "(" ^ String.concat ", " (List.map string_of_expr el) ^ ")"

let rec string_of_stmt = function
  | Expr(expr) -> string_of_expr expr ^ ";\n";
  | If(conds) -> "\n" ^ string_of_first_cond_stmts (List.hd conds) ^ "\n" ^
    (String.concat "\n" (List.map string_of_cond_stmts (List.tl conds)))
  | While(e, s) -> "while (" ^ string_of_expr e ^ ") " ^ "{" ^ String.concat "\n" (List.map string_of_stmt s) ^ "}"
  | Break -> "break"
  | Continue -> "continue"

and string_of_first_cond_stmts = function
  | (None, stmts) -> "else {\n" ^ (String.concat "\n" (List.map string_of_stmt stmts))
  | (Some(expr), stmts) -> "if (" ^ (string_of_expr expr) ^ ") \n {\n" ^
    (String.concat "\n" (List.map string_of_stmt stmts)) ^
    "}\n"

and string_of_cond_stmts = function
  | (None, stmts) -> "else {\n" ^ (String.concat "\n" (List.map string_of_stmt stmts)) ^ "}\n"
  | (Some(expr), stmts) -> "else if (" ^ (string_of_expr expr) ^ ") \n {\n" ^
    (String.concat "\n" (List.map string_of_stmt stmts)) ^ "}\n"

let string_of_range range =
  match range with
  | [] -> ""
  | hd::tl -> (match hd with Range(id, st, ed, inc) ->
    (match st, ed, inc with
      | Literal(lst), Some(sed), Some(sinc) ->
        (match sed, sinc with Literal(led), Literal(linc) ->
          " " ^ id ^ " in range(" ^ string_of_float lst ^ ", " ^
            string_of_float led ^ ") "
          | _ -> "")
        | Literal(lst), Some(sed), None ->
        (match sed with Literal(led) ->
          " " ^ id ^ " in range(" ^ string_of_float lst ^ ", " ^
            string_of_float led ^ ") "
          | _ -> "")
        | Literal(lst), None, None ->
          " " ^ id ^ " in range(" ^ string_of_float lst ^ ") "
        | _ -> ""))

let string_of_multieq multieq =
  multieq.fname ^
  "\n = {\n" ^
  String.concat "" (List.map string_of_stmt multieq.fbody) ^
  "\n}\n"

let string_of_ctxdecl ctx =
  ctx.context ^
  "\n = {\n" ^
  String.concat "" (List.map string_of_multieq ctx.cbody) ^
  "\n}\n"

let string_of_finddecl finddecl =
  finddecl.fcontext ^
  "\n: find " ^
  finddecl.ftarget ^
  string_of_range finddecl.frange ^
  "\n {\n" ^
  String.concat "" (List.map string_of_stmt finddecl.fbody) ^
  "\n}\n"

let string_of_program (contexts, findexprs) =
  String.concat "" (List.map string_of_ctxdecl contexts) ^ "\n" ^
  String.concat "\n" (List.map string_of_finddecl findexprs)

```

codegen.ml

```

(* Code generation: translates semantically checked AST & produces vanilla C. *)

module A = Ast
module S = Sast
module IntMap = S.IntMap

module StringMap = Map.Make(String)

let translate sast =
  let (contexts, finds) = sast.S.ast in
  let varmap = sast.S.vars in
  let liblist = sast.S.lib in
  let eqs = sast.S.eqs in

  (* let fail msg = raise (Failure msg) in *)

  (* to remove debug messages: `let debug msg = "" in` *)
  (* let debug msg = msg in *)
  (* let info msg = msg in *)

  (* SAST helper functions *)
  let get_deps_indeps_from_context ctxname =
    let ctx_sast = StringMap.find ctxname eqs in
    (ctx_sast.S.ctx_deps, ctx_sast.S.ctx_indeps)
  in

  let get_find_from_context ctxname findname =
    let ctx_sast = StringMap.find ctxname eqs in
    StringMap.find findname ctx_sast.S.ctx_finds
  in

  (* SAST helper functions end *)

  let rec gen_expr = function
  | A.Strlit(l) -> "\"" ^ l ^ "\""
  | A.Literal(l) -> string_of_float l
  | A.Id(s) -> s
  | A.Binop(e1, o, e2) -> let check_op o =
      match A.string_of_op o with
      | "%" -> "fmod(" ^ gen_expr e1 ^ ", " ^ gen_expr e2 ^ ")"
      | "^" -> "pow(" ^ gen_expr e1 ^ ", " ^ gen_expr e2 ^ ")"
      | _ -> gen_expr e1 ^ " " ^ A.string_of_op o ^ " " ^ gen_expr e2 in check_op o
  | A.Unop(o, e) -> let check_unop o =
      match A.string_of_uop o with
      | "|" -> "fabs(" ^ gen_expr e ^ ")"
      | _ -> A.string_of_uop o ^ "(" ^ gen_expr e ^ ")" in check_unop o
  | A.Assign(v, e) -> v ^ " = " ^ gen_expr e
  | A.Builtin("print", el) -> let generate_expr el = List.map gen_expr el in
      let check_type expr_str =
        match expr_str with
        | [] -> "printf()"
        | hd::tl -> if tl != [] then "printf(" ^ hd ^ ", " ^
            String.concat ", " (List.map (fun x -> "(double) ("
            ^ x ^ ")") tl) ^ ")"
            else "printf(" ^ hd ^ ")"
      in check_type (generate_expr el)
  | A.Builtin(f, el) -> f ^ "(" ^ String.concat ", " (List.map gen_expr el) ^ ")"

  in

  let rec gen_stmt = function
  | A.Expr(expr) -> gen_expr expr ^ ";";
  | A.While(e, stmts) -> "while (" ^ gen_expr e ^ "){\n" ^ String.concat "\n" (List.rev (List.map gen_stmt stmts))
  | A.Continue -> "continue;\n"
  | A.Break -> "break;\n"
  | A.If (l) -> string_of_first_cond_exec (List.hd l) ^ "\n" ^
    (String.concat "\n" (List.map string_of_cond_exec (List.tl l)))

  and string_of_first_cond_exec = function
  | (Some(expr), stmts) -> "if (" ^ (gen_expr expr) ^ ")\n {\n" ^
      String.concat "\n" (List.map gen_stmt stmts) ^
      "\n}"
  | _ -> ""

  and string_of_cond_exec = function
  | (None, stmts) -> "else {\n" ^
      String.concat "\n" (List.map gen_stmt stmts) ^
      "\n}"
  | (Some(expr), stmts) -> "else if (" ^ (gen_expr expr) ^ ")\n {\n" ^
      String.concat "\n" (List.map gen_stmt stmts) ^
      "\n}"

```

```

in
  (* param is_indeps: whether the stmt is generated for a variable in indeps *)
let rec gen_stmt_for_multieq is_indeps = function
| A.Expr(expr) -> (
  match expr with
  | A.Builtin("print", el) -> gen_expr expr ^ ";\n"
  | A.Assign(left, expr) -> (
    match expr with
    | A.Literal(l) -> "double " ^ left ^ "=" ^ string_of_float l ^ ";\n"
    | _ -> left ^ "=" ^ gen_expr expr ^ ";\n"
  )
  | _ ->
    if is_indeps
    then "(double) (" ^ gen_expr expr ^ ");\n"
    else "return (double) (" ^ gen_expr expr ^ ");\n" )
| A.While(e, stmts) -> "while (" ^ gen_expr e ^ "){\n" ^ String.concat "\n" (List.rev (List.map (gen_stmt_for_multieq is_indeps) stmts)) ^
  ";\n"
| A.Continue -> "continue;\n"
| A.Break -> "break;\n"
| A.If (l) -> (string_of_first_cond_exec is_indeps) (List.hd l) ^ "\n" ^
  (String.concat "\n" (List.map (string_of_cond_exec is_indeps) (List.tl l)))

and string_of_first_cond_exec is_indeps = function
| (Some(expr), stmts) -> "if (" ^ (gen_expr expr) ^ ")\n {\n" ^
  (String.concat "\n" (List.map (gen_stmt_for_multieq is_indeps) stmts)) ^
  ";\n"
| _ -> ""

and string_of_cond_exec is_indeps = function
| (None, stmts) -> "else {\n" ^
  (String.concat "\n" (List.map (gen_stmt_for_multieq is_indeps) stmts)) ^
  ";\n"
| (Some(expr), stmts) -> "else if (" ^ (gen_expr expr) ^ ")\n {\n" ^
  (String.concat "\n" (List.map (gen_stmt_for_multieq is_indeps) stmts)) ^
  ";\n"

in

let get_id_range finddecl =
  match finddecl.A.frange with
  | [] -> ""
  | hd :: tl -> (match hd with A.Range(id, st, ed, inc) -> id)

in

let gen_varlist varname _ varlist =
  if StringMap.mem varname varlist then
    varlist
  else
    StringMap.add varname "whatever" varlist

in

let gen_varlist_from_find_relation _ relation varlist =
  let varlist =
    StringMap.fold gen_varlist relation.S.deps varlist
  in
  StringMap.fold gen_varlist relation.S.indeps varlist

in

let gen_decl_var varname funcdecl str =
  "double " ^ varname ^ ";\n" ^ str

in

let gen_decl_ctx_and_find (find_sast: S.equation_relations IntMap.t) finddecl =
  let ctxname = finddecl.A.fcontext in
  let rangelist = finddecl.A.frange in
  let varmap_for_ctx = StringMap.find ctxname varmap in
  (* varlist: is a map of with the key is the variable needed to generate declaration for variables *)
  let varlist = StringMap.fold gen_varlist varmap_for_ctx StringMap.empty in
  let varlist = IntMap.fold gen_varlist_from_find_relation find_sast varlist in
  let varlist =
    List.fold_left
      (fun varlist range ->
        match range with A.Range(varname, _, _, _) ->
          if StringMap.mem varname varlist then
            StringMap.remove varname varlist
          else
            varlist
        )
      varlist
    rangelist
  in
  StringMap.fold gen_decl_var varlist "\n"

in

```

```

let gen_function_for_one_ctx ctx =
  let (deps, indeps) = get_deps_indeps_from_context ctx.A.context in
  let rec gen_function_for_multieq count multieq_list =
    match multieq_list with
    | [] -> []
    | hd::tl ->
      let arg_str =
        if (StringMap.mem hd.A.fname deps) then
          String.concat ", " (List.map (fun args -> "double " ^ args) (StringMap.find hd.A.fname deps))
        else
          ""
      in
      (Printf.sprintf "%s_%d (%s){\n%s}\n"
       hd.A.fname count
       arg_str
       (String.concat "\n" (List.map (gen_stmt_for_multieq false) hd.A.fdbody))
      ) :: (
        gen_function_for_multieq (count+1) tl
      )
  in
  String.concat "\n" (List.map (fun x -> Printf.sprintf "double %s_%s" ctx.A.context x)
    (gen_function_for_multieq 0 ctx.A.cbody))
in

(* NOTE: this's still not working as expected... `visited` doesn't prevent duplicate assignments *)
(* but since duplicates are not a problem we don't necessarily have to fix this if we don't have time *)
let rec gen_multieq_call_in_find (deps, indeps) visited varmap_for_ctx varname =
  if StringMap.mem varname visited then
    ""
  else if not (StringMap.mem varname varmap_for_ctx) then
    (* happens when a variable is first defined in `finddecl` *)
    ""
  else
    let multieq_name = (StringMap.find varname varmap_for_ctx).A.fname in
    let visited = StringMap.add varname "" visited in

    if StringMap.mem varname deps then
      let deplist = StringMap.find varname deps in
      String.concat
        "\n"
        (List.map
          (gen_multieq_call_in_find (deps, indeps) (StringMap.add varname "" visited) varmap_for_ctx)
          deplist)
    ^
      Printf.sprintf "%s = %s(%s);\n" varname multieq_name (String.concat ", " deplist)
    else if StringMap.mem varname indeps then
      Printf.sprintf "%s = %s();\n" varname multieq_name
    else
      (* assume that the variable is declared elsewhere before this function is called *)
      ""
  in

let rec gen_findname_from_find count = function
| [] -> []
| hd::tl -> ("find_" ^ hd.A.fcontext ^ "_" ^ (string_of_int count))
  ::
    (gen_findname_from_find (count+1) tl)
in

let gen_wrapped_find_func_prototype_list finddecl_list =
  let get_for_loop_range finddecl =
    match finddecl.A.frange with
    | [] -> ""
    | hd :: tl -> (match hd with A.Range(id, st, ed, inc) ->
      (match st, ed, inc with
      | A.Literal(lst), Some(sed), Some(sinc) ->
        (match sed, sinc with
        | A.Literal(led), A.Literal(linc) ->
          if linc >= 0.
          then
            Printf.sprintf "for(%s=%f; %s<=%f; %s=%s+%f)" id lst id led id id linc
          else
            Printf.sprintf "for(%s=%f; %s>=%f; %s=%s+%f)" id lst id led id id linc
        | _ -> ""))
      | A.Literal(lst), Some(sed), None ->
        (match sed with
        | A.Literal(led) ->
          if lst < led then
            Printf.sprintf "for(%s=%f; %s<=%f; %s++)" id lst id led id
          else
            Printf.sprintf "for(%s=%f; %s>=%f; %s--)" id lst id led id
        | _ -> ""))
  )

```

```

        | A.Literal(lst), None, None ->
            if lst > 0. then
                Printf.sprintf "for(%s=0; %s<=%f; %s++)" id id lst id
            else
                Printf.sprintf "for(%s=0; %s>=%f; %s--)" id id lst id
        | _ -> ""
    ))
in
let rec gen_wrapped_find_func_prototype count find_list =
    match find_list with
    | [] -> []
    | hd::tl -> (match get_id_range hd with
        | "" -> ((Printf.sprintf "void find %s %d_range(){\n" hd.A.fcontext count) ^
            (Printf.sprintf "find %s %d(%s);\n\n" hd.A.fcontext count (get_id_range hd)))::(gen_wrap
        | _ -> ((Printf.sprintf "void find %s %d_range(){\n" hd.A.fcontext count) ^
            (Printf.sprintf "double %s;\n" (get_id_range hd)) ^
            get_for_loop_range hd ^ "\n" ^
            (Printf.sprintf "find %s %d(%s);\n\n\n" hd.A.fcontext count (get_id_range hd)))::(gen_wrap
    )
    in List.rev (gen_wrapped_find_func_prototype 0 finddecl_list)
in
let get_ctx_by_name ctx_name =
    let rec cmp_ctx_with_name ctxlist =
        match ctxlist with
        | [] -> []
        | hd::tl -> if hd.A.context = ctx_name then [hd]
            else cmp_ctx_with_name tl
    in (match cmp_ctx_with_name contexts with
        | hd::tl -> Some(hd)
        | [] -> None
    )
in
(* return: {variable_name: multieqname}, type String StringMap.t *)
let gen_find_function findname finddecl =
    let (deps, indeps) = get_deps_indeps_from_context finddecl.A.fcontext in
    let find_sast = get_find_from_context finddecl.A.fcontext findname in
    let varmap_for_ctx = StringMap.find finddecl.A.fcontext varmap in
    let varlist = StringMap.fold (fun key value lst -> key::lst) varmap_for_ctx [] in
    (***** Helper functions for the current finddecl { *****)
    let rec gen_finddecl_deps (str, count, cur_expr_number) expr =
        let count = count + 1 in
        let cur_expr_number =
            if IntMap.mem count find_sast then
                count
            else
                cur_expr_number
        in
        (* let str = debug (str ^ "// cur_expr = " ^ (A.string_of_expr expr) ^ "\n") in *)
        (* let str = debug (str ^ "// cur_expr_number = " ^ (string_of_int cur_expr_number) ^ "\n") in *)
        (* let str = debug (str ^ "// count = " ^ (string_of_int count) ^ "\n") in *)
        match expr with
        | A.Id(_) | A.Literal(_) | A.Strlit(_) -> (str, count, cur_expr_number)
        | A.Binop(eLeft, _, eRight) ->
            gen_finddecl_deps (gen_finddecl_deps (str, count, cur_expr_number) eLeft) eRight
        | A.Unop(_, e) -> gen_finddecl_deps (str, count, cur_expr_number) e
        | A.Assign(id, e) ->
            let (str, count, cur_expr_number) = gen_finddecl_deps (str, count, cur_expr_number) e in
            let deps = (IntMap.find cur_expr_number find_sast).S.deps in
            let deplist =
                StringMap.fold (fun key value lst -> key::lst) deps []
            in
            ( str ^
                String.concat
                ""
                (List.map
                    (gen_multieq_call_in_find (deps, StringMap.empty) StringMap.empty varmap_for_ctx
                    deplist)
                , count, cur_expr_number
            )
        | A.Builtin(_, exprlist) -> List.fold_left gen_finddecl_deps (str, count, cur_expr_number) exprlist
    in
let gen_finddecl_stmt (str, count, cur_expr_number) stmt =
    let str = str ^ (gen_stmt stmt) in
    match stmt with
    | A.Expr(expr) ->
        let (str, count, cur_expr_number) =
            (gen_finddecl_deps (str, count, cur_expr_number) expr)

```

```

        in
          (str, count, cur_expr_number)
    | _ -> (str, count, cur_expr_number)
in
  (**** Helper functions for the current finddecl end ) ****)

  (* naming of the function: find_(context_name)_(golabl_counting_num) *)
  "void " ^ findname ^ "(" ^
  ((fun x -> match x with | "" -> " "
    | _ -> "double " ^ x ) (get_id_range finddecl)) ^
  ")" ^ "\n" ^
  gen_decl_ctx_and_find find_sast finddecl ^
  (match (get_ctx_by_name finddecl.A.fcontext) with
  | Some(cxt) ->
    String.concat
      "\n"
      (List.map (gen_multieq_call_in_find (deps, indeps) StringMap.empty varmap_for_ctx) varlist)
  | None -> ""
  ) ^ "\n" ^
  (* info "//-----gen_finddecl_stmt-----\n" ^ *)
  (fun (a, _, _) -> a) (List.fold_left gen_finddecl_stmt ("", 0, 0) finddecl.A.fbody) ^
  "}\n\n"
in
  let gen_find_func_call_list finddecl_list =
    let rec gen_find_func_call count find_list =
      match find_list with
      | [] -> []
      | hd::tl -> ("find_" ^ hd.A.fcontext ^ "_" ^ (string_of_int count) ^ "_range ();\n"
       )::(gen_find_func_call (count+1) tl)
    in List.rev (gen_find_func_call 0 finddecl_list)
  in
    let lib =
      let add_lib header head_lib =
        if (List.mem header head_lib) then head_lib else header::head_lib
      in
        let add_lib_for_dep head elem =
          match elem with
          | "%" | "^" | "|" | "cos" | "sin" | "tan" | "sqrt" | "log" -> add_lib "#include <math.h>\n" head
          | "print" -> add_lib "#include <stdio.h>\n" head
          | _ -> head
        in List.fold_left add_lib_for_dep [] liblist
      in
        String.concat "" lib ^
        String.concat "\n" (List.map gen_function_for_one_ctx contexts) ^
        String.concat "" (List.map2 gen_find_function (gen_findname_from_find 0 finds) finds) ^
        String.concat "" (gen_wrapped_find_func_prototype_list finds) ^
        "int main() {\n" ^
        String.concat "" (gen_find_func_call_list finds) ^
        " return 0;\n}\n"

```

debugtokens.ml

```

open Parser
open Ast

let stringify = function
| LPAREN -> "LPAREN"
| RPAREN -> "RPAREN"
| LBRACE -> "LBRACE"
| RBRACE -> "RBRACE"
| SEMI -> "SEMI"
| COLON -> "COLON"
| COMMA -> "COMMA"
| PLUS -> "PLUS"
| MINUS -> "MINUS"
| TIMES -> "TIMES"
| DIVIDE -> "DIVIDE"
| MOD -> "MOD"
| POW -> "POW"
| ABS -> "ABS"
| ASSIGN -> "ASSIGN"
| EQ -> "EQ"
| NEQ -> "NEQ"
| LT -> "LT"
| LEQ -> "LEQ"
| GT -> "GT"
| GEQ -> "GEQ"

```

```

| AND -> "AND"
| OR -> "OR"
| NOT -> "NOT"
| IF -> "IF"
| ELSE -> "ELSE"
| WHILE -> "WHILE"
| BREAK -> "BREAK"
| CONTINUE -> "CONTINUE"
| STRLIT(lxm) -> "STRLIT"
| FIND -> "FIND"
| WITH -> "WITH"
| IN -> "IN"
| RANGE -> "RANGE"
| LITERAL(lxm) -> "LITERAL"
| ID(lxm) -> "ID"
| CTX(lxm) -> "CTX"
| EOF -> "EOF"

let _ =
let lexbuf = Lexing.from_channel stdin in
let rec print_tokens = function
  | EOF -> " "
  | token ->
    print_endline (stringify token);
    print_tokens (Scanner.token lexbuf) in
print_tokens (Scanner.token lexbuf)

```

eqeq.ml

```

(* Top-level of the EqualsEquals compiler:
 * 0. accept debugging commandline flags,
 * 1. bind scanner to stdin as input,
 * 2. parse scanned tokens into AST,
 * 3. semantic analysis of AST, into SAST,
 * 4. codegen of from SAST
 *)

type cli_arg = Ast | Sast | Compile

exception Error of string

let _ =
  (* Step 0: Debug flags *)
  let cli_arg =
    if Array.length Sys.argv > 1 then
      List.assoc Sys.argv.(1) [
        ("-a", Ast);      (* Print the AST only *)
        ("-s", Sast);
        ("-c", Compile)  (* Generate, check C *)
      ]
    else Compile
  in

  (* Step 1: Scanner (starts here) *)
  let lexbuf = Lexing.from_channel stdin in

  (* Step 2: Parser *)
  let ast =
    try
      Parser.program Scanner.token lexbuf
    with exn ->
      begin
        let curr = lexbuf.Lexing.lex_curr_p in
        let line = string_of_int curr.Lexing.pos_lnum in
        let cnum = string_of_int (curr.Lexing.pos_cnum - curr.Lexing.pos_bol) in
        let tok = Lexing.lexeme lexbuf in
        (*let tail = Scanner.ruleTail "" lexbuf in*)

        let messageForError e =
          "line " ^ line ^
          " (char " ^ cnum ^ "): " ^
          "!" ^ tok ^ "!" ^ ""
          (* TODO: call ``^ "\n" ^ tail` here on limited for 40 chars or so *)
        in
        raise (Error(messageForError exn))
      end
  in
in

```



```

(* Steps 3: Semantic Analysis *)
let sast = Semant.check_ast in

(* Steps 4: Codegen *)
match cli_arg with
| Ast -> print_string (Ast.string_of_program ast)

| Compile -> print_string (Codegen.translate sast)
| Sast -> print_string (Sast.str_of_checked sast)

```

relation.ml

```

module A = Ast
module S = Sast
module StringMap = Map.Make(String)

let fail msg = raise (Failure msg)
let quot content = "\"" ^ content ^ "\""

(* eg, for expression, "a = 3 + b;", return ["b"]. *)
let get_ids (e : A.expr) : string list =
  let rec ids_expr (accum : string list) : string list = match expr with
  | A.Id(id) -> id::accum
  | A.Literal(_) | A.Strlit(_) -> accum
  | A.Binop(el, _, er) -> ids er (ids el accum)
  | A.Unop(_, e) -> ids e accum
  | A.Assign(_, e) -> ids e accum
  | A.Builtin(_, eLi) ->
    List.fold_left (fun a e -> ids e a) accum eLi
  in ids e []

(* Newest value in `map`; ie: where largest key <= `i` *)
let latest (asof : int) (m : S.equation_relations S.IntMap.t) : S.equation_relations =
  let rec walkBack i =
    try S.IntMap.find i m with Not_found ->
    if i > 0 then walkBack (i - 1) else fail (
      Printf.sprintf
        "Compiler BUG: empty rel-map at expression #%d [only found: '%s']"
        asof (String.concat " ", ' ' (
          S.IntMap.fold
            (fun k v a -> (string_of_int k)::a)
            m []
        )))
  in walkBack asof

(* Lists all `A.Id`s in the given `stmt` *)
let rec getStmtDeps (stmt : A.stmt) : string list =
  let rec getAssignDeps (foundDeps : string list) (st : A.stmt) : string list =
    let getExprIDs (accum : string list) e : string list = (get_ids e)@accum in

    let accumStmtLi accum (sLi : A.stmt list) =
      List.fold_left (fun a s -> a@(getStmtDeps s)) accum sLi
    in

    match st with
    | A.Break | A.Continue -> foundDeps
    | A.Expr(e) -> getExprIDs foundDeps e
    | A.If(stmtOrTupleList) -> (
      let rec idsInIf accumul = function
      | [] -> accumul
      | (None,sLi)::t -> idsInIf (accumStmtLi accumul sLi) t
      | (Some(e),sLi)::t ->
        idsInIf (getExprIDs (accumStmtLi accumul sLi) e) t
      in idsInIf foundDeps stmtOrTupleList
      )
    | A.While(e, s) -> getExprIDs (accumStmtLi foundDeps s) e
  in getAssignDeps [] stmt

let check_deps_resolvable (id : string) (m : S.equation_relations) : unit =
  (* Asserts identifier terminates in `m`, and hasn't already been seen. *)
  let rec terminates (target : string) (seen : bool StringMap.t) : unit =
    if StringMap.mem target seen
    then fail (
      "Cyclical dependency under, " ^
      quot target ^ "; stopped at ID=" ^ quot id
    )
    else if not (StringMap.mem target m.S.indeps) then (

```

```

    if StringMap.mem target m.S.deps
    then
      List.iter (
        fun dp -> terminates dp (StringMap.add target true seen);
      ) (StringMap.find target m.S.deps)
    else
      fail (
        "Unresolvable identifier, " ^ (quot target) ^
        " found while following " ^ (quot id) ^
        "'s dependency chain."
      );
  )
  in terminates id StringMap.empty

let is_resolvable id m : bool =
  try
    check_deps_resolvable id m;
    true
  with _ -> false

(* List.fold_left handler for a context.A.cbody; Returns its accumulator. *)
let ctxBodyRelator ((m : S.equation_relations), (urs : string list)) (meq : A.multi_eq) =
  let rec exprRelator (eRels, unresolveds) = function
  | A.Id(id) ->
    if is_resolvable id eRels
    then (eRels, unresolveds)
    else (eRels, id::unresolveds)
  | A.Literal(_) | A.Strlit(_) -> (eRels, unresolveds)
  | A.Binop(eLeft, _, eRight) ->
    exprRelator (exprRelator (eRels, unresolveds) eLeft) eRight
  | A.Unop(_, e) -> exprRelator (eRels, unresolveds) e
  | A.Assign(id, e) ->
    (** traverse depth first *)
    let (current, u) = exprRelator (eRels, unresolveds) e in

    let deps = List.sort_uniq String.compare u in

    let forked : S.equation_relations =
      if List.length deps > 0
      then
        {
          S.deps = StringMap.add id deps current.S.deps;
          S.indeps = StringMap.remove id current.S.indeps;
        }
      else
        {
          S.deps = StringMap.remove id current.S.deps;
          S.indeps = StringMap.add id [A.Expr(e)] current.S.indeps;
        }
    in (forked, deps)
  | A.Builtin(_, exprLis) ->
    List.fold_left exprRelator (eRels, unresolveds) exprLis
  in

  let rec stLiRelator acc (sLi : A.stmt list) : (S.equation_relations * string list) =
    let statementRelator (m, u) = function
    | A.Break | A.Continue -> (m, u)
    | A.Expr(e) -> exprRelator (m, u) e
    | A.If(stmtTupleWithOptionalExpr) ->
      let rec relationsInIf accum = function
      | [] -> accum
      | (None, sLi)::tail -> relationsInIf (stLiRelator accum sLi) tail
      | (Some(e), sLi)::tail ->
        relationsInIf (stLiRelator (exprRelator accum e) sLi) tail
      in relationsInIf (m, u) stmtTupleWithOptionalExpr
    | A.While(e, sLi) -> stLiRelator (exprRelator (m, u) e) sLi
    in
    List.fold_left (fun a s -> statementRelator a s) acc sLi
  in stLiRelator (m, urs) meq.A.fdbody

(* List.fold_left handler an initial map of contexts' equations, before, and
 * start an empty map for their find blocks. *)
let relationCtxFolder (relations : S.eqResolutions) ctx =
  let diToRelations d i : S.equation_relations =
    { S.deps = d; S.indeps = i; }
  in

  let ctxScope =
    let equationRels : S.equation_relations =
      let ctx_body_folder rels mEq =
        let (r, unresolveds) = ctxBodyRelator (rels, []) mEq in

        let deps = List.sort_uniq String.compare unresolveds in

```

```

    let eqName = mEq.A.fname in
    if List.length deps > 0
    then (
      diToRelations
        (StringMap.add eqName deps r.S.deps)
        (StringMap.remove eqName r.S.indeps)
    )
    else (
      diToRelations
        (StringMap.remove eqName r.S.deps)
        (StringMap.add eqName mEq.A.fbody r.S.indeps)
    )

  in List.fold_left
    ctx_body_folder
    (diToRelations StringMap.empty StringMap.empty)
    ctx.A.cbody

  in {
    S.ctx_deps = equationRels.S.deps;
    S.ctx_indeps = equationRels.S.indeps;
    S.ctx_finds = StringMap.empty; (* is handled using `findStmtRelator` *)
  }
  in StringMap.add ctx.A.context ctxScope relations

(* List.fold_left handler for find decl's fbody. *)
let rec findStmtRelator ((m : S.equation_relations S.IntMap.t), (i : int)) (st : A.stmt) =
  let asrt_resolves (root : string) (m : S.equation_relations S.IntMap.t) i =
    check_deps_resolvable root (latest i m)
  in

  let rec exprRelator (eMap, idx) (expr : A.expr) =
    let i = idx + 1 in match expr with
    | A.Id(id) -> asrt_resolves id eMap i; (eMap, i)
    | A.Literal(_) | A.Strlit(_) -> (eMap, i)
    | A.Binop(eLeft, _, eRight) ->
      exprRelator (exprRelator (eMap, i) eLeft) eRight
    | A.Unop(_, e) -> exprRelator (eMap, i) e
    | A.Assign(id, e) ->
      (** traverse depth first *)
      let (m, i) = exprRelator (eMap, i) e in

      let current = latest i m in
      let deps = List.filter (fun dep -> dep <> id) (get_ids e) in
      let forked : S.equation_relations =
        let isReAssignOfDependent : bool = StringMap.mem id current.S.deps in
        let isIndependent = List.length deps <= 0 in

        if isReAssignOfDependent || isIndependent
        then
          {
            S.deps = StringMap.remove id current.S.deps;
            S.indeps = StringMap.add id [A.Expr(e)] current.S.indeps;
          }
        else
          {
            S.deps = StringMap.add id deps current.S.deps;
            S.indeps = StringMap.remove id current.S.indeps;
          }
      in ((S.IntMap.add i forked m), i)
    | A.Builtin(_, exprLis) -> List.fold_left exprRelator (eMap, i) exprLis
  in

  let stLiRelator acc (sLi : A.stmt list) =
    List.fold_left (fun a s -> findStmtRelator a s) acc sLi
  in

  in match st with
  | A.Break | A.Continue -> (m, i)
  | A.Expr(e) -> exprRelator (m, i) e
  | A.If(stmtTupleWithOptionalExpr) ->
    let rec relationsInIf accum = function
      | [] -> accum
      | (None, sLi)::tail -> relationsInIf (stLiRelator accum sLi) tail
      | (Some(e), sLi)::tail ->
        relationsInIf (stLiRelator (exprRelator accum e) sLi) tail
    in relationsInIf (m, i) stmtTupleWithOptionalExpr
  | A.While(e, sLi) -> stLiRelator (exprRelator (m, i) e) sLi

let findInitRelator (f : A.find_decl) (c : S.ctx_scopes) : (S.equation_relations S.IntMap.t * int) =
  let dummyRangeExpr id : A.stmt list =

```

```

let placeholderMessage =
  Printf.sprintf
    "SHOULD NEVER PRINT! dummy placeholder to indicate `%s = range(...)` has no dependences"
    id
in [A.Expr(A.Builtin("print", [A.Strlit(placeholderMessage)]))]
in
(* Initial map from starting with contexts' own relationships *)
let inheritedCtxMap : S.equation_relations S.IntMap.t =
  let baseRelations : S.equation_relations = {
    S.indeps = c.S.ctx_indeps;
    S.deps = c.S.ctx_deps;
  } in S.IntMap.add 0 baseRelations S.IntMap.empty
in

let range_folder ((m : S.equation_relations S.IntMap.t), (i : int)) (r : A.range) =
  let (assignTo, start, last, incr) = match r with | A.Range (a, s, l, i) ->
    (a, s, l, i)
  in

  let keysOfMap m : string list = StringMap.fold (fun k v li -> k::li) m [] in

  let originalDeps : string list = keysOfMap ((latest i m).S.deps) in

  (* list-compare; is list `newRels` equal to `originalDeps` *)
  let haveDepsGrown (newDeps : string list) : bool =
    let left : string list = List.sort String.compare originalDeps in
    let right : string list = List.sort String.compare newDeps in

    left <> right
  in

  let (rangeRels, idx) =
    let optExprRelator accum optE : 'accum =
      match optE with
      | None -> accum (* do nothing *)
      | Some(e) -> findStmtRelator accum (A.Expr(e))
    in

    List.fold_left
      (fun a optExpr -> optExprRelator a optExpr)
      (findStmtRelator (m, i) (A.Expr(start)))
      [last; incr]
  in

  let forked : S.equation_relations =
    let id = assignTo in
    let current = latest idx rangeRels in
    let newDeps = keysOfMap (current.S.deps) in

    if haveDepsGrown newDeps
    then
      {
        S.deps = StringMap.add id newDeps current.S.deps;
        S.indeps = StringMap.remove id current.S.indeps;
      }
    else
      {
        S.deps = StringMap.remove id current.S.deps;
        S.indeps = StringMap.add id (dummyRangeExpr id) current.S.indeps;
      }
  in

  let rangeIdx = idx + 1 in

  ((S.IntMap.add rangeIdx forked rangeRels), rangeIdx)
in List.fold_left range_folder (inheritedCtxMap, 0) f.A.frange

```

sast.ml

```

(* Semantic Analysis API: `checked` AST *)

module A = Ast
module StringMap = Map.Make(String)
module IntMap = Map.Make(
  struct
    type t = int
    let compare = compare
  end
)

```

```

)

type equation_deps = (string list) StringMap.t
type variables_indeps = (A.stmt list) StringMap.t

type equation_relations = {
  deps: equation_deps;
  indeps: variables_indeps;
}

type find_scopes = (equation_relations IntMap.t) StringMap.t

type ctx_scopes = {
  ctx_deps: equation_deps;
  ctx_indeps: variables_indeps;
  ctx_finds: find_scopes;
}

(* <CtxName(string), ctx_scopes> *)
type eqResolutions = (ctx_scopes StringMap.t)

(* Map: <ctx.context, <multieq.fname, multieq>> *)
type varMap = (Ast.multi_eq StringMap.t) StringMap.t
type liblist = string list

type checked = {
  ast: Ast.program;
  eqs: eqResolutions;
  vars: varMap;
  lib: liblist;
}

(* pretty print *)
let str_of_checked chk =
  let indent depth =
    let rec indentStr = function
      | 0 -> []
      | i -> "  " :: (indentStr (i - 1))
    in List.fold_left (fun s ind -> s ^ ind) "" (indentStr depth)
  in

  (* Thin wrapper for `StringMap.fold` that passes extra `depth` field in
  * accumulator, and discards it in the final result. *)
  let strMapFold func str_map accumulator startDepth =
    let (result, _) =
      StringMap.fold func str_map (accumulator, startDepth)
    in result
  in

  (* Thin wrapper for `IntMap.fold`, identical to strMapFold. *)
  let intMapFold func int_map accumulator startDepth =
    let (result, _) =
      IntMap.fold func int_map (accumulator, startDepth)
    in result
  in

  let str_of_deps eq_name (depList : string list) (str, (depth : int)) =
    let rendered =
      str ^
      indent depth ^ eq_name ^
      ": [" ^ (String.concat " " depList) ^ "]\n"
    in (rendered, depth)
  in
  let str_of_indeps eq_name (stmtList : A.stmt list) (str, depth) =
    let rendered =
      let indented_stmts = List.map (
        fun stmt -> indent (depth + 1) ^ A.string_of_stmt stmt
      ) stmtList in
      str ^
      String.concat "\n" [
        indent depth ^ eq_name ^ " : ````";
        String.concat "" indented_stmts;
        indent depth ^ "````";
      ] ^ "\n"
    in (rendered, depth)
  in
  let str_of_finds fdname (finds : (equation_relations IntMap.t)) (str, depth) =
    let str_of_eqrelmap exprIndex (relmap : equation_relations) (str, depth) =
      let rendered =

```

```

str ^
String.concat "\n" [
  (indent depth) ^ "[" ^ string_of_int exprIndex ^ "]: {";

  String.concat "\n" [
    indent (depth + 1) ^ "deps:" ;
    strMapFold str_of_deps relmap.deps "" (depth + 2);

    indent (depth + 1) ^ "indeps:" ;
    strMapFold str_of_indeps relmap.indeps "" (depth + 2);
  ];

  (indent depth) ^ "}";
] ^ "\n"
in (rendered, depth)
in

let rendered =
str ^
String.concat "\n" [
  indent depth ^ "\"\" ^ fdname ^ "\": {";
  String.concat "\n" [
    intMapFold str_of_eqrelmap finds "" (depth + 1)
  ];
  indent depth ^ "}\n";
] ^ "\n"
in (rendered, depth)
in

let str_of_ctxscope ctxname scope (str, depth) =
let rendered =
  indent depth ^

String.concat "\n" [
  str;
  ctxname ^ " : {";

  String.concat "\n" [
    indent (depth + 1) ^ "deps:";
    strMapFold str_of_deps scope.ctx_deps "" (depth + 2);

    indent (depth + 1) ^ "indeps:";
    strMapFold str_of_indeps scope.ctx_indeps "" (depth + 2);

    indent (depth + 1) ^ "finds:";
    strMapFold str_of_finds scope.ctx_finds "" (depth + 2);
  ];
  "},";
] ^ "\n"
in (rendered, depth)

in (strMapFold str_of_ctxscope chk.eqs "" 0)

```

semant.ml

```

(* Semantic checking for the EqualsEquals compiler *)

module A = Ast
module S = Sast
module R = Relation
module StringMap = Map.Make(String)

(* Semantic checking of a program. Returns void if successful,
   throws an exception if something is wrong.

   Check each context, then check each find declaration *)
let check (contexts, finds) =
let fail msg = raise (Failure msg) in
let quot content = "\"" ^ content ^ "\"" in
let ex_gt expr = A.string_of_expr expr in
let bop_gt bop = A.string_of_op bop in
let uop_gt uop = A.string_of_uop uop in
(* add variable in global context to all the context *)
let rec get_global_contexts global_context new_contexts contexts =
match contexts with
| [] -> (global_context, new_contexts)
| hd::tl -> if (hd.A.context = "Global")
then (get_global_contexts (global_context @ hd.A.cbody) new_contexts tl)

```

```

        else (get_global_contexts global_context (hd::new_contexts) tl)
in
let add_multieqs_in_global_contexts_to_contexts tuple =
  { A.context = "Global"; A.cbody = (fst tuple) } ::
  (List.map (fun x -> { A.context = x.A.context; A.cbody = x.A.cbody @ (fst tuple)})
    (snd tuple))
in
let new_contexts contexts =
  add_multieqs_in_global_contexts_to_contexts (get_global_contexts ([]:(A.multi_eq list)) ([]:(A.ctx_decl list)) cc
in
let contexts:(A.ctx_decl list) = new_contexts contexts
in

(* Map of variables to their decls. For more, see: S.varMap *)
let varmap =
  let create_varmap map ctx =
    let gen_varmap (map, count) multieq =
      let modified_multieq = {
        A.fname = ctx.A.context ^ "_" ^ multieq.A.fname ^ "_" ^ (string_of_int count);
        A.fbody = multieq.A.fbody;
      }
    in
    (StringMap.add multieq.A.fname modified_multieq map, count + 1)
  in
  List.fold_left create_varmap StringMap.empty contexts
in

(* Raise an exception if the given rvalue type cannot be assigned to
the given lvalue type *)
let check_assign lvaluet rvaluet err =
  if lvaluet == rvaluet then lvaluet else raise err
in

TODO: possible ^ given how we've structured string-literals in our grammar? *)

let eqrelations : S.eqResolutions =
  (* `Sast.eqResolutions` to which we'll add `S.equation_relations` *)
  let ctxRelations : S.eqResolutions =
    List.fold_left R.relationCtxFolder StringMap.empty contexts
  in

  (* Add a complete picture of contexts' find decl relations, maintaining an
  * index along the way, then discard the last index and just return the
  * completed map. *)
  let (sastEqRels, _) =
    (* Fold `S.equation_relations` to respective Contexts' `S.ctx_scopes` *)
    let relationFindFolder (relations, findIdx) fnDec =
      let findName = Printf.sprintf "find_%s_%d" fnDec.A.fcontext findIdx in
      (* `Sast.ctx_scopes` for which we're creating an `findName` entry. *)
      let ctxScopes : Sast.ctx_scopes =
        try StringMap.find fnDec.A.fcontext relations
        with Not_found ->
          fail ("find targeting unknown context, " ^ quot fnDec.A.fcontext)
      in
      (* TODO: after building deps/indeps (findBodyMap), ensure
      * `fnDec.ftarget` is known key (of either deps or indeps is fine) *)
      let extendedRels : S.eqResolutions =
        (* Map from expression index to a `Sast.equation_relations` *)
        let findRelationMap : (S.equation_relations S.IntMap.t) =
          (* Build a complete map of expression-index to relations for this
          * find body, then discard the latest index and return that map. *)
          let (eqRels, _) =
            List.fold_left
              R.findStmtRelator
              (R.findInitRelator fnDec ctxScopes)
              fnDec.A.fbody
          in eqRels
        in
        let ctxFinds : S.find_scopes =
          StringMap.add findName findRelationMap ctxScopes.S.ctx_finds

```

```

    in

    let scopes = {
      S.ctx_deps = ctxScopes.S.ctx_deps;
      S.ctx_indeps = ctxScopes.S.ctx_indeps;
      S.ctx_finds = ctxFinds;
    } in StringMap.add fnDec.A.fcontext scopes relations

    in (extendedRels, findIdx + 1)

  in List.fold_left relationFindFolder (ctxRelations, 0) finds

in sastEqRels
in

(* list of EqualsEquals symbols that require external library support *)
let liblist =
let rec add_lib_expre lis = function
  A.Binop(left,op,right)-> (
    match op with
    |A.Mod -> "%":lis
    |A.Pow -> "^":lis
    |_ -> (add_lib_expre lis left)@(add_lib_expre lis right)@lis )
| A.Unop(op, expr) -> (
  match op with
  |A.Abs -> "|":lis
  |_ -> add_lib_expre lis expr )
| A.Assign(left, expr) -> add_lib_expre lis expr
| A.Builtin(name, expr) -> (
  match name with
  | "cos" | "sin" | "tan" | "sqrt" | "log" -> name::lis
  | "print" -> "print"::(List.fold_left add_lib_expre lis expr)
  |_ -> List.fold_left add_lib_expre lis expr )
|_ -> lis
in
let rec add_lib_stmt_ctx lis = function
  A.Expr e-> add_lib_expre lis e
  |A.If(l) -> let rec check_if_list_lib lis = function
    | [] -> lis
    | hd::tl -> check_if_list_lib (List.append lis (check_if_list_lib hd)) tl
    in check_if_list_lib lis l
  |A.While(p, stmts) -> List.fold_left add_lib_stmt_ctx lis stmts
  |_ -> lis
and check_if_list_lib lis = function
| (None, sl) -> List.fold_left add_lib_stmt_ctx lis sl
| (Some(e), sl) -> List.append (add_lib_expre lis e) (List.fold_left add_lib_stmt_ctx lis sl)
in
let rec add_lib_stmt lis = function
  A.Expr e-> add_lib_expre lis e
  |A.If(l) -> let rec check_if_list_lib lis = function
    | [] -> lis
    | hd::tl -> check_if_list_lib (List.append lis (check_if_list_lib hd)) tl
    in check_if_list_lib lis l
  |A.While(p, stmts) -> List.fold_left add_lib_stmt lis stmts
  |_ -> lis
in
let create_liblist_finds lis finds =
  List.fold_left
  add_lib_stmt
  lis
  finds.A.fbody
in
let create_liblist_ctx lis ctx =
  List.fold_left
  add_lib_stmt_ctx
  lis
  ctx.A.fbody
in
(* append list from finds block with list from contexts block *)
List.append
(List.fold_left create_liblist_finds [] finds)
(List.fold_left (fun lis eq -> List.fold_left create_liblist_ctx lis eq.A.cbody) [] contexts)
in

let check_have_var var symbolmap =
  try StringMap.find var symbolmap with
  Not_found -> fail ("variable not defined, " ^ quot var)
in

let rec check_expr e =
  match e with
  | A.Literal(lit) -> ()
  | A.Strlit(str) -> ()

```



```

    | A.Id(id) -> ()
    | A.Binop(left, op, right) -> check_expr left; check_expr right;
        not_print left (bop_gt op); not_print right (bop_gt op)
    | A.Unop(op, expr) -> check_expr expr; (not_print expr (uop_gt op))
    | A.Assign(left, expr) -> check_expr expr
    | A.Builtin(name, expr) -> (fail_illegal_builtin name expr); List.iter check_expr expr

and not_print expr op =
  match expr with
  | A.Builtin(name, expr) -> (
    match name with
    | "print" -> fail("Illegal use of operator on print, " ^ quot op)
    | _ -> ()
  )
  | _ -> ()

and fail_illegal_builtin_arg_str_asgn name str =
  match name with
  | "cos" | "sin" | "tan" | "sqrt" | "log" -> fail ("illegal argument for " ^ name ^ ", " ^ quot str)
  | _ -> fail ("unknown built-in function, " ^ quot name)

and fail_illegal_builtin_arg s hd =
  match s, hd with
  | s, A.Assign(left, expr) -> fail_illegal_builtin_arg_str_asgn s (left ^ "=" ^ ex_gt expr)
  | s, A.Strlit(str) -> fail_illegal_builtin_arg_str_asgn s str
  | "sqrt", A.Literal(l) -> if l < 0. then fail ("illegal argument for sqrt, " ^ quot (string_of_float l))
  | "log", A.Literal(l) -> if l <= 0. then fail ("illegal argument for log, " ^ quot (string_of_float l))
  | "log", _ | "cos", _ | "sin", _ | "sqrt", _ | "tan", _ -> ()
  | s, _ -> fail ("unknown built-in function, " ^ quot s)

and fail_illegal_builtin name expr_list =
  match name, expr_list with
  | "print", expr -> List.iter check_expr expr
  | s, hd::tl -> fail_illegal_builtin_arg s hd; fail_illegal_num_of_builtin_arg tl
  | _ -> ()

and fail_illegal_num_of_builtin_arg tl =
  match tl with
  | [] -> ()
  | _ -> fail("illegal argument, " ^ quot (String.concat " " (List.map ex_gt tl)))

in

let rec fail_illegal_if_predicate = function
  | A.Assign(left, expr) -> fail ("illegal if argument, " ^ "\"" ^ left ^ " = " ^ ex_gt expr ^ "\"")
  | A.Builtin(name, expr) -> (
    match name with
    | "print" -> fail ("illegal if argument, \"print\")
    | _ -> ()
  )
  | A.Strlit(s) -> fail ("illegal if argument, " ^ quot s)
  | _ -> ()

in
(* Verify a statement or throw an exception *)
let rec check_stmt_break_continue blk err_stmt = function
  | A.Expr e -> ()
  | A.If(l) -> let rec check_if_list = function
    | [] -> ()
    | hd::tl -> let check_stmt_break_continue_in_if stmt =
        check_stmt_break_continue blk "if statement of " stmt
      in List.iter check_stmt_break_continue_in_if (snd hd); check_if_list tl
    in check_if_list l
  | A.While(p, s) -> () (* stop now. any 'break' below here is valid *)
  | A.Continue -> fail("Inadquate usage of Continue in " ^ err_stmt ^ blk ^ ", 'Continue' should only exist in while loop")
  | A.Break -> fail("Inadquate usage of Break in " ^ err_stmt ^ blk ^ ", 'Break' should only exist in while loop" )

in
let rec check_stmt = function
  | A.Expr e -> check_expr e; (
    match e with
    | A.Builtin(name, expr) -> ()
    | A.Assign(left, expr) -> ()
    | A.Strlit(str) -> fail ("cannot return string " ^ quot str)
    | A.Literal(lit) -> ()
    | _ -> ()
  )
  | A.If(l) -> (let rec check_if_list = function
    | [] -> ()
    | hd::tl -> check_if hd; check_if_list tl
    in check_if_list l
  )
  | A.While(p, s) -> check_expr p; List.iter check_stmt s
  | A.Continue -> ()
  | A.Break -> ()

and check_if = function
  | (None, sl) -> List.iter check_stmt sl

```

```

| (Some(e), sl) -> fail_illegal_if_predicate e; check_stmt (A.Expr e); List.iter check_stmt sl
(**** Checking Context blocks ****)
in
let check_ctx ctxBlk =
let check_eq eq = List.iter check_stmt eq.A.fbody
in
let sum_list l =
match l with
| hd::tl -> List.fold_left (fun x y -> x + y) hd tl
| [] -> 0
in
let min_list l =
match l with
| hd::tl -> List.fold_left min hd tl
| [] -> -1
in
let rec check_return_in_stmt stmt =
match stmt with
| A.Expr e -> (
match e with
| A.Builtin(name, expr) -> (
match name with
| "print" -> 0
| _ -> 1
)
| A.Assign(left, expr) -> 0
| _ -> 1
)
| A.Continue | A.Break -> 0
| A.If(l) -> min_list ((List.map check_if_for_return l) @ last_one_in_if_else l)
| A.While(p, s) -> check_return_stmt_list s
and check_if_for_return = function
| (None, sl) -> check_return_stmt_list sl
| (Some(e), sl) -> check_return_stmt_list sl
and check_return_stmt_list sl = sum_list (List.map check_return_in_stmt sl)
and last_one_in_if_else l =
match List.hd (List.rev l) with
| (Some(e), sl) -> [0]
| _ -> []
in
let check_return_count num_return eqName ctxName=
match num_return with
| 0 -> fail ("missing return in equation " ^ quote eqName ^" under context " ^ quote ctxName)
| _ -> ()
in
let check_return_eq eq = check_return_count (check_return_stmt_list eq.A.fbody) eq.A.fname ctxBlk.A.context
in
(* TODO: semantic analysis of variables, allow undeclared and all the stuff
* that makes our lang special... right here!
let knowns = [] in
let unknowns = [] in
*)

(* vanilla logic;
let equation_decl var =
try StringMap.find s function_decls
with Not_found -> raise (Failure ("unrecognized variable " ^ quote s))
in
*)
List.iter check_eq ctxBlk.A.cbody; List.iter check_return_eq ctxBlk.A.cbody
in

let check_each_range findBlk =
let check_no_str field ctx (target : string) (expr : A.expr) : unit =
match expr with
| A.Strlit(str) -> fail (
Printf.sprintf
"Find block in %s: %s has range with illegal %s-argument, '%s'"
ctx target field str
)
| _ -> ()
in
let chk_rng (r : A.range) : unit = match r with A.Range(id, st, ed, inc) ->
let check_some_expr_not_str field optional = match optional with
| Some(e) -> check_no_str field findBlk.A.fcontext id e
| _ -> ()
in
check_no_str "start" findBlk.A.fcontext id st;
check_some_expr_not_str "end" ed;
check_some_expr_not_str "increment" inc
in

```

```

match findBlk.A.frange with
| [] -> ()
| hd::tl -> chk_rng hd
in
(**** Checking Find blocks ****)
let check_find findBlk =
  let symbolmap =
    let ctx_name = findBlk.A.fcontext in
    try StringMap.find ctx_name varmap
    with Not_found -> fail ("unrecognized context, " ^ quot ctx_name)
  in
  (* Verify a particular `statement` in `find` or throw an exception *)
  let rec check_stmt_for_find = function
    | A.Expr e -> check_expr e; (
      match e with
      | A.Builtin(name, expr) -> ()
      | A.Assign(left, expr) -> ()
      | a -> fail ("invalid return in find " ^ quot (ex_qt a)
      )
    (*check_expr e*)
    | A.If(l) -> let rec check_if_list = function
      | [] -> ()
      | hd::tl -> check_if hd; check_if_list tl
      in check_if_list l
    | A.While(p, stmts) -> check_expr p; List.iter check_stmt_for_find stmts
    | A.Continue -> ()
    | A.Break -> ()
  in
  ignore (check_have_var findBlk.A.ftarget symbolmap);
  List.iter check_stmt_for_find findBlk.A.fbody
in
(*add function to cheack the usage of Break and Continue
Break & Continue are allowed only in While loop *)
(* check Break and Continue for the contexts *)
let check_ctx_break_continue ctxBlk =
  let check_eq_break_continue eq = List.iter (check_stmt_break_continue "Contexts_Declaration" "") eq.A.fbody in
  List.iter check_eq_break_continue ctxBlk.A.cbody
in
(* check Break and Continue for the finds *)
let check_find_break_continue findBlk = List.iter (check_stmt_break_continue "Finds_Declaration" "") findBlk.A.fbody
in
let rec get_global_contexts global_context new_contexts contexts =
  match contexts with
  | [] -> (global_context, new_contexts)
  | hd::tl -> if (hd.A.context = "Global")
    then (get_global_contexts (global_context @ hd.A.cbody) new_contexts tl)
    else (get_global_contexts global_context (hd::new_contexts) tl)
in
let add_multieqs_in_global_contexts_to_contexts tuple =
  { A.context = "Global"; A.cbody = (fst tuple) } ::
  (List.map (fun x -> { A.context = x.A.context; A.cbody = x.A.cbody @ (fst tuple) })
   (snd tuple))
in
let new_contexts contexts =
  add_multieqs_in_global_contexts_to_contexts (get_global_contexts ([]:(A.multi_eq list)) ([]:(A.ctx_decl list)) cc)
in
let contexts:(A.ctx_decl list) = new_contexts contexts
in
List.iter check_ctx_break_continue contexts;
List.iter check_find_break_continue finds;
List.iter check_each_range finds;
List.iter check_ctx contexts;
List.iter check_find finds;

{
  S.ast = (contexts, finds);
  S.eq = eqrelations;
  S.vars = varmap;
  S.lib = liblist;
}

```

scanner.mll

```
(* Ocamllex scanner for EqualsEquals *)
```

```
{ open Parser }
```

```

let intgr = ['0'-'9']
let lowercase = ['a'-'z']
let uppercase = ['A'-'Z']
let alpha_num = lowercase | uppercase | intgr
let sign = '+' | '-'
let expo = 'e' | 'E'
let sci_note = expo sign? intgr+
let decimal = '.' intgr+
let frac = decimal sci_note? | decimal? sci_note

let num = '-'? (intgr+ frac? | intgr* frac)

let identifier = lowercase (alpha_num | '_' ) *
let context_id = uppercase identifier

let whitespace = [' ' '\t' '\r']
let newline = '\n' | "\r\n"
let reserved = ("int" | "double" | "char" | "float" | "const" | "void" | "short" | "struct"
               | "long" | "return" | "static" | "switch" | "case" | "default" | "for" | "do" | "goto"
               | "auto" | "signed" | "extern" | "register" | "enum" | "sizeof" | "typedef" | "union"
               | "volatile" | "Global")

rule token = parse
| whitespace           { token lexbuf }
| "/"                 { comment lexbuf }
| newline              { Lexing.new_line lexbuf; token lexbuf }
| reserved as illegalid { raise (Failure("illegal namespace " ^ String.escaped illegalid)) }
| '('                 { LPAREN }
| ')'                 { RPAREN }
| '{'                 { LBRACE }
| '}'                 { RBRACE }
| ';'                 { SEMI }
| ':'                 { COLON }
| ','                 { COMMA }
| '+'                 { PLUS }
| '-'                 { MINUS }
| '*'                 { TIMES }
| '/'                 { DIVIDE }
| '%'                 { MOD }
| '^'                 { POW }
| '|'                 { ABS }
| '='                 { ASSIGN }
| "=="                { EQ }
| "!="                { NEQ }
| '<'                 { LT }
| "<="                { LEQ }
| ">"                 { GT }
| ">="                { GEQ }
| "&&"                { AND }
| "||"                { OR }
| "!"                 { NOT }
| "if"                 { IF }
| "else"               { ELSE }
| "while"              { WHILE }
| "find"               { FIND }
| "break"              { BREAK }
| "continue"           { CONTINUE }
| "with"               { WITH }
| "in"                 { IN }
| "range"              { RANGE }
| ''' ([[^\''']*) as lxm) ''' { STRLIT(lxm) }
| num as lxm           { LITERAL(float_of_string lxm) }
| identifier as lxm    { ID(lxm) }
| context_id as lxm    { CTX(lxm) }
| eof { EOF }
| _ as char            { raise (Failure("illegal character " ^ Char.escaped char)) }

and comment = parse
  "/" { token lexbuf }
| _ { comment lexbuf }

and ruleTail acc = parse
| eof { acc }
| _* as str { ruleTail (acc ^ str) lexbuf }

```

parser.mly

```
/* Ocaml yacc parser for EqualsEquals */
```

```

%{
open Ast
%}

%token SEMI LPAREN RPAREN LBRACE RBRACE COMMA COLON
%token PLUS MINUS TIMES DIVIDE MOD POW ABS ASSIGN NOT
%token EQ NEQ LT LEQ GT GEQ AND OR
%token IF ELSE WHILE FIND WITH IN RANGE BREAK CONTINUE
%token <float> LITERAL
%token <string> ID
%token <string> STRLIT
%token <string> CTX
%token EOF

%right ASSIGN
%left OR
%left AND
%left EQ NEQ
%left LT GT LEQ GEQ
%left PLUS MINUS
%left TIMES DIVIDE MOD POW
%right NOT NEG

%start program
%type <Ast.program> program

%%

program:
  decls EOF { $1 }

decls:
  /* nothing */      { [], [] }
| decls ctxtdecl    { ($2 :: fst $1), snd $1 }
| decls finddecl    { fst $1, ($2 :: snd $1) }
/**
 * TODO: add ability for global-context function declarations to exist:
 * What does statement-action look like? Does it matter? Probably needs to be
 * prioritized higher than both contexts and find blocks :|
 *
 * | decls funcdecl { fst $1, ($2 :: snd $1) }
 *
 */

/* TODO: improve funcdeclt_list to make it better */
ctxtdecl:
  | CTX ASSIGN LBRACE funcdecl_list RBRACE
  { { context = $1; cbody = List.rev $4 } }
  | global_assign global_assign_list SEMI
  { { context = "Global"; cbody = $1 :: (List.rev $2) } }

global_assign:
  | ID ASSIGN LITERAL
  { { fname = $1; fbody = [Expr(Literal($3))] } }

global_assign_list:
  /* nothing */ { [] }
  | global_assign_list COMMA global_assign { $3 :: $1 }

funcdecl:
  ID ASSIGN LBRACE stmt_list RBRACE
  { { fname = $1; fbody = List.rev $4 } }
  | ID ASSIGN stmt
  { { fname = $1; fbody = [$3] } }

finddecl:
  FIND ID LBRACE stmt_list RBRACE
  { { fcontext = "Global"; (* global context *)
    ftarget = $2;
    frange = [];
    fbody = List.rev $4 } }
  | CTX COLON FIND ID LBRACE stmt_list RBRACE
  { { fcontext = $1;
    ftarget = $4;
    frange = [];
    fbody = List.rev $6 } }
  | FIND ID WITH stmt_list LBRACE stmt_list RBRACE
  { { fcontext = "Global"; (* global context *)
    ftarget = $2;
    frange = [];
    fbody = (List.rev $4) @ (List.rev $6) } }

```

```

| CTX COLON FIND ID WITH stmt_list LBRACE stmt_list RBRACE
  { { fcontext = $1;
    ftarget = $4;
    frange = [];
    fbody = (List.rev $6) @ (List.rev $8) } }
| FIND ID WITH stmt_list range LBRACE stmt_list RBRACE
  { { fcontext = "Global"; (* global context *)
    ftarget = $2;
    frange = [$5];
    fbody = (List.rev $4) @ (List.rev $7) } }
| CTX COLON FIND ID WITH stmt_list range LBRACE stmt_list RBRACE
  { { fcontext = $1;
    ftarget = $4;
    frange = [$7];
    fbody = (List.rev $6) @ (List.rev $9) } }

funcdecl_list:
  /* nothing */ { [] }
  | funcdecl_list funcdecl { $2 :: $1 }

stmt_list:
  /* nothing */ { [] }
  | stmt_list stmt { $2 :: $1 }

/*
findpost_list:
  { [], [] }
  | findpost_list stmt_list { ($2 :: fst $1), snd $1 }
  | findpost_list range_list { fst $1, ($2 :: snd $1) }

range_list:
  { [] }
  | range_list range { $2 :: $1 }
*/

range:
  | ID IN RANGE LPAREN literal RPAREN SEMI {Range($1, $5, None, None)}
  | ID IN RANGE LPAREN literal COMMA literal RPAREN SEMI {Range($1, $5, Some($7), None)}
  | ID IN RANGE LPAREN literal COMMA literal COMMA literal RPAREN SEMI {Range($1, $5, Some($7), Some($9))}

stmt:
  expr SEMI { Expr $1 }
  | IF LPAREN expr RPAREN LBRACE stmt_list RBRACE elif_stmt_list else_stmt { If(List.rev ($9 @ List.rev $8 @ [(Some($1
  | WHILE LPAREN expr RPAREN LBRACE stmt_list RBRACE { While($3, $6) }
  | BREAK SEMI { Break }
  | CONTINUE SEMI { Continue }

elif_stmt_list:
  /* nothing */ { [] }
  | elif_stmt_list elif_stmt { $1 @ $2 }

elif_stmt:
  | ELSE IF LPAREN expr RPAREN LBRACE stmt_list RBRACE { [(Some($4), List.rev $7)] }

else_stmt:
  /* nothing */ { [] }
  | ELSE LBRACE stmt_list RBRACE { [(None, List.rev $3)] }

expr:
  literal { $1 }
  | ID { Id($1) }
  | expr PLUS expr { Binop($1, Add, $3) }
  | expr MINUS expr { Binop($1, Sub, $3) }
  | expr TIMES expr { Binop($1, Mult, $3) }
  | expr DIVIDE expr { Binop($1, Div, $3) }
  | expr MOD expr { Binop($1, Mod, $3) }
  | expr POW expr { Binop($1, Pow, $3) }
  | ABS expr ABS { Unop(Abs, $2) }
  | expr EQ expr { Binop($1, Equal, $3) }
  | expr NEQ expr { Binop($1, Neq, $3) }
  | expr LT expr { Binop($1, Less, $3) }
  | expr LEQ expr { Binop($1, Leq, $3) }
  | expr GT expr { Binop($1, Greater, $3) }
  | expr GEQ expr { Binop($1, Geq, $3) }
  | expr AND expr { Binop($1, And, $3) }
  | expr OR expr { Binop($1, Or, $3) }
  | MINUS expr %prec NEG { Unop(Neg, $2) }
  | NOT expr { Unop(Not, $2) }
  | ID ASSIGN expr { Assign($1, $3) }
  | ID LPAREN actuals_opt RPAREN { Builtin($1, $3) }
  | LPAREN expr RPAREN { $2 }

```

```

literal:
  LITERAL { Literal($1) }
  | STRLIT { Strlit($1) }

actuals_opt:
  /* nothing */ { [] }
  | actuals_list { List.rev $1 }

actuals_list:
  expr { [$1] }
  | actuals_list COMMA expr { $3 :: $1 }

```

Makefile

```

OPAM_INIT      = ~/.opam/opam-init/init.sh
BIN_DIR        = ./bin/
OCAM_BLD_OPTS  = -use-ocamlfind
PARSER_GENR    := ocaml yacc
TEST_OPTS      := -v
TEST_SUITE     = e2e-tests

all : clean eeqq

# Real targets:

eeqq :
  bash -c 'source $(OPAM_INIT) && ocamlbuild $(OCAM_BLD_OPTS) ./${@.native}'

scanner scanner.ml : scanner.mll
  ocamllex scanner.mll

# usage: `make PARSER_GENR=menhir {parser,eeqq,...}`
parser parser.ml parser.mli : parser.mly
  $(PARSER_GENR) parser.mly

%.cmo : %.ml
  ocamlc -c $<

%.cmi : %.mli
  ocamlc -c $<

debugtokens : debugtokens.ml
  bash -c 'source $(OPAM_INIT) && ocamlbuild $(OCAM_BLD_OPTS) ./${@.native}'

.PHONY : clean test eeqq all e2e warnEeqq

e2e : test lint

# colorize warnings from ocaml compiler
warnEeqq:
  $(MAKE) eeqq | grep --color=auto -E '^[^Warning]'

test : clean warnEeqq $(BIN_DIR)/$(TEST_SUITE).sh
  $(BIN_DIR)/$(TEST_SUITE).sh $(TEST_OPTS)

lint:
  @$ (BIN_DIR)/lint.sh

clean :
  ocamlbuild -clean
  $(BIN_DIR)/$(TEST_SUITE).sh -c
  $(RM) ./$(TEST_SUITE).log
  $(RM) *.diff *.native scanner.ml
  $(RM) parser.ml parser.mli parser.output parser.conflicts
  $(RM) *.cmx *.cmi *.cmo *.cmx *.o

# Generated 20160321@18:20, with:
#   make clean &&
#   make scanner &&
#   make parser &&
#   ocamldep *.ml *.mli
ast.cmo :
ast.cmx :
codegen.cmo : sast.cmo ast.cmo
codegen.cmx : sast.cmx ast.cmx

```

```
debugtokens.cmo : scanner.cmo parser.cmi ast.cmo
debugtokens.cmx : scanner.cmx parser.cmx ast.cmx
epeq.cmo : semant.cmo scanner.cmo sast.cmo parser.cmi codegen.cmo ast.cmo
epeq.cmx : semant.cmx scanner.cmx sast.cmx parser.cmx codegen.cmx ast.cmx
parser.cmo : ast.cmo parser.cmi
parser.cmx : ast.cmx parser.cmi
relation.cmo : sast.cmo ast.cmo
relation.cmx : sast.cmx ast.cmx
sast.cmo : ast.cmo
sast.cmx : ast.cmx
scanner.cmo : parser.cmi
scanner.cmx : parser.cmx
semant.cmo : sast.cmo relation.cmo ast.cmo
semant.cmx : sast.cmx relation.cmx ast.cmx
parser.cmi : ast.cmo
```

tests/fail-break-before-continue.eq

```
SomeContext = {
  a={1;}
}
SomeContext: find a {
  continue;
  break;
}
```

tests/fail-break-in-as-variable.eq

```
SomeContext = {
  break = { 1; }
}
SomeContext:find break {
  if ( break==1){
  }
}
```

tests/fail-break-in-context-decl.eq

```
SomeContext = {
  a = { break; }
}
SomeContext:find a {
}
```

tests/fail-break-in-else.eq

```
SomeContext = {
  a = { 42.333; }
}
SomeContext:find a {
  if (3>4){
    a = 3;
  }
  else if (4>3){
    a = 4;
    break;
  }
}
```

tests/fail-break-in-finds_decl.eq


```
SomeContext = {
  a={1;}
}
SomeContext: find a {
  break;
}
```

tests/fail-break-in-if.eq

```
SomeContext = {
  a={1;}
}
SomeContext: find a{
  if(a<3){
    print("%.0f\n",a);
    break;
  }
}
```

tests/fail-break-in-if-expr.eq

```
SomeContext = {
  a = { 1; }
}
SomeContext:find a {
  if ( a==1 && break;){
    a=2;
  }
}
```

tests/fail-builtin-in-print.eq

```
SomeContext = {
  a = { 42.333; }
}

SomeContext:find a {
  print("%.0f\n", sqrt(-3));
}
```

tests/fail-built-in-print-in-ctx.eq

```
SomeContext = {
  a = { 42.333; }
  b = {pr("%.0f\n", a);}
}

SomeContext:find a {
  print("%.0f\n", a);
}
```

tests/fail-built-in-print-in-find.eq

```
SomeContext = {
  a = { 42.333; }
}

SomeContext:find a {
  pr("%.0f\n", a);
}
```

tests/fail-continue-in-as-variable.eq

```
SomeContext = {
  continue = { 1; }
}
SomeContext:find break {
  if ( continue ==1){
  }
}
```

tests/fail-continue-in-context_del.eq

```
SomeContext = {
  a = { continue; }
}
SomeContext:find a {
}
```

tests/fail-continue-in-else.eq

```
SomeContext = {
  a = { 42.333; }
}
SomeContext:find a {
  if (3>4){
    a = 3;
  }
  else if (4>3){
    a = 4;
    print("%.0f\n", a);
    print("%.0f\n", a + 1);
    print("%.0f\n", a + 2);
  }
  else if (4>3){
    a = 4;
    continue;
  }
}
```

tests/fail-continue-in-finds.eq

```
SomeContext = {
  a={1;}
}
SomeContext: find a {
  continue;
}
```

tests/fail-continue-in-if.eq

```
SomeContext = {
  a={1;}
}
SomeContext: find a {
  if(a==1){
    print("%.0f\n",a);
    continue;
    print("%.0f\n",a + 1);
  }else{
}
```

```
    print("%.0f\n", a + 2);
  }
}
```

tests/fail-continue-in-if-expr.eq

```
SomeContext = {
  a = { 1; }
}
SomeContext:find a {
  if ( a==1 && continue;){
    a=2;
  }
}
```

tests/fail-cos-illegal-arg-assign.eq

```
SomeContext = {
  a = { 42.333; }
}
SomeContext:find a {
  cos(a=8);
}
```

tests/fail-cos-illegal-arg-str.eq

```
SomeContext = {
  a = { 42.333; }
}
SomeContext:find a {
  cos("abc");
}
```

tests/fail-cos-multi-assign.eq

```
SomeContext = {
  a = { 42.333; }
}
SomeContext:find a {
  cos(8,9,10);
}
```

tests/fail-double-brace.eq

```
SomeContext = {
  a = {{1;}}
}
SomeContext: find a {
}
```

tests/fail-duplicate-contexts.eq

```
MyContext = {
  someVal = { 42; }
}

MyContext = {
  unrelatedVal = { 24; }
}

MyContext:find someVal {
  print("someVal is '%.0f'\n", someVal);
}
```

tests/fail-else-if-bad-syntax.eq

```
SomeContext = {
  a = { 42.333; }
}

SomeContext:find a {
  if (3 > 4){
    print("inside: if!\n");
  } elseif (3 < 4) {
    print("inside: else if!\n");
  }
}
```

tests/fail-else-if-empty-predicate.eq

```
SomeContext = {
  a = { 42.333; }
}

SomeContext:find a {
  if (3>4){
    print("inside: if!\n");
  } else if ( ) {
    print("inside: else if!\n");
  }
}
```

tests/fail-find-unrecognized-context.eq

```
Cats = {
  lots = { 42; }
}

Dogs:find lots {
  print("how many is lots? lots is %.f\n", lots);
}
```

tests/fail-if-ctx-assign-predicate.eq

```
SomeContext = {
  a = { 42.333; }
  b = { if (a=b){
    print("inside: if!\n");
    1;
  }
  else{
    print("inside: else!\n");
    0;
  }
}
```

```
    }
  }
}

SomeContext:find a {
}
```

tests/fail-if-ctx-else-else-if.eq

```
SomeContext = {
  a = { 42.333; }
  b = { if (3>4){
    print("inside: if!\n");
  }
  else{
    print("inside: else!\n");
  }
  else if ( ) {
    /* it should raise error for else if not the empty predicate
    print("inside: else if!\n");
  }
}

SomeContext:find a {
}
```

tests/fail-if-ctx-empty-predicate.eq

```
SomeContext = {
  a = {1;}
  b = { if ( ) {
    print("%.0f\n",a);
    0;
  }
}

SomeContext: find a {
}
```

tests/fail-if-ctx-print-predicate.eq

```
SomeContext = {
  a = { 42.333; }
  b = { if (print("")){
    print("inside: if!\n");
    1;
  }
  else{
    print("inside: else!\n");
    0;
  }
}

SomeContext:find a {
}
```

tests/fail-if-ctx-string-predicate.eq

```
SomeContext = {
  a = { 42.333; }
  b = { if ("hello world"){
    print("inside: if!\n");
    1;
  }
}
```

```

    }
    else if ("hello world") {
      print("inside: else if!\n");
      0;
    }
  }
}

SomeContext:find a {
}

```

tests/fail-if-find-assign-predicate.eq

```

SomeContext = {
  a = { 42.333; }
  b = { 24.666; }
}

SomeContext:find a {
  if (a = b) {
    print("inside: if!\n");
  } else {
    print("inside: else!\n");
  }
}

```

tests/fail-if-find-else-else-if.eq

```

SomeContext = {
  a = { 42.333; }
}

SomeContext:find a {
  if (3>4){
    print("inside: if!\n");
  }
  else{
    print("inside: else!\n");
  }
  else if ( ) {
    /* it should raise error for else if not the empty predicate
    print("inside: else if!\n");
  }
}

```

tests/fail-if-find-empty-predicate.eq

```

SomeContext = {
  a={1;}
}

SomeContext: find a {
  if ( ) {
    print("%.0f\n",a);
  }
}

```

tests/fail-if-find-print-predicate.eq

```

SomeContext = {
  a = { 42.333; }
}

SomeContext:find a {
  if (print("")){
    print("inside: if!\n");
  }
}

```

```
    }
    else{
        print("inside: else!\n");
    }
}
```

tests/fail-if-find-string-predicate.eq

```
SomeContext = {
    a = { 42.333; }
}

SomeContext:find a {
if ("hello world"){
    print("inside: if!\n");
}
else if ("hello world") {
    print("inside: else if!\n");
}
}
```

tests/fail-illegal-namespace-int.eq

```
SomeContext = {
    a = 0;
    int = { 0; }
}

SomeContext: find a {
}
```

tests/fail-illegal-namespace-struct.eq

```
SomeContext = {
    struct = { 0; }
}

SomeContext: find a {
}
```

tests/fail-illegal-namespace-void.eq

```
SomeContext = {
    a = 0;
    void = { 0; }
}

SomeContext: find a {
}
```

tests/fail-illegal-print-binop.eq

```
SomeContext = {
    a = { 42.333; }
}

SomeContext:find a {
    print("%0.0f ", a)-print("%0.0f ", a);
}
```

tests/fail-illegal-print-unop.eq

```
SomeContext = {
  a = { 42.333; }
}

SomeContext:find a {
  -print("%0.0f ", a);
}
```

tests/fail-in-without-range.eq

```
SomeCtx = {
  a = { 42; }
  b = { 32; }
}

SomeCtx:find a in b = 3; { /* 'in' need to be followed by range */
  print("%0.0f\n", a);
}
```

tests/fail-lazyresolved-cyclical.eq

```
SomeCtx = {
  a = { c + 40; }
  c = { b + 1; }
}

SomeCtx:find a {
  /* ERROR: cycle: b -> a -> c -> b */
  b = a + 1;

  print("a = %0.0f (when b = %0.0f)\n", a, b);
}
```

tests/fail-lazyresolved-vars.eq

```
SomeCtx = {
  a = { b + 40; }
  c = { 3; }
}

SomeCtx:find c {
  print("a = %0.0f\n", a);
}
```

tests/fail-lazyresolved-vars-new-cycle.eq

```
SomeCtx = {
  a = { c + 40; }
  c = { b + 1; }
}

SomeCtx:find c {
  /* OK: valid program */
  b = 3;
  print("a = %0.0f (when b = %0.0f)\n", a, b);
}
```



```
/* Error: NEW CYCLE! */
b = a + 1;
print("a = %.0f (when b depends on a!)\n", a);
}
```

tests/fail-log-illegal-arg-assign.eq

```
SomeContext = {
  a = { 42.333; }
}

SomeContext:find a {
  log(a=8);
}
```

tests/fail-log-illegal-arg-str.eq

```
SomeContext = {
  a = { 42.333; }
}

SomeContext:find a {
  log("abc");
}
```

tests/fail-log-zero.eq

```
SomeContext = {
  a = { 42.333; }
}

SomeContext:find a {
  log(0);
}
```

tests/fail-multieq-without-return.eq

```
SomeContext = {
  a = { print("42\n"); }
}

SomeContext:find a {
  print("%.0f\n", a);
}
```

tests/fail-no-return-in-else-ctx.eq

```
SomeContext = {
  a = { 42.333; }
  b = { if (3>2){
    a;
  }
  else {
  }
}
}
```

```
SomeContext:find a {
  print("%.0f\n", -3);
}
```

tests/fail-no-space-after-minus.eq

```
SomeContext = {
  a={1;}
}

SomeContext:find a {
  print("%.0f\n",a-1); /* fail b/c space are needed after the - sign */
}
```

tests/fail-parser-tries-to-show-token.eq

```
SomeCtx = {
  a = { b + 40 }
  /** ^ Note we are missing a semi-colon */
}

SomeCtx:find a with b = 2 {
  print("a = %.0f (when b = %.0f)\n", a, b)
}
```

tests/fail-range-missing-semi.eq

```
SomeCtx = {
  a = { 42; }
  b = { 32; }
  c = { 10; }
}

SomeCtx:find a with b = 3; c in range(3) { /* missing semicolon after 'range(3)' */
  print("%.0f\n", a);
}
```

tests/fail-range-without-arguments.eq

```
SomeCtx = {
  a = { 42; }
  b = { 32; }
}

SomeCtx:find a with c in range(); { /* range has to take at least one argument */
  print("%.0f\n", a);
}
```

tests/fail-range-without-in.eq

```
SomeCtx = {
  a = { 42; }
  b = { 32; }
}

SomeCtx:find a range(3); { /* the 'in' in front of range is missing */
  print("%.0f\n", a);
}
```

tests/fail-range-with-string-passedin-end-param.eq

```
SomeCtx = {
  a = { 42; }
  b = { 32; }
}

SomeCtx:find a with c in range(10, "abc", 0); { /* range can only take numbers as its arguments */
  print("%.0f\n", a);
}
```

tests/fail-range-with-string-passedin-increment-param.eq

```
SomeCtx = {
  a = { 42; }
}

/* range can only take numbers as its arguments */
SomeCtx:find a with c in range(3, 5, "abc"); {
  print("%.0f\n", a);
}
```

tests/fail-range-with-string-passedin-start-param.eq

```
SomeCtx = {
  a = { 42; }
  b = { 32; }
}

SomeCtx:find a with c in range("abc"); { /* range can only take numbers as its arguments */
  print("%.0f\n", a);
}
```

tests/fail-return-in-ctx-nested-string.eq

```
SomeContext = {
  b = { if (5>2){
    "This";
  }
  else{
    "is illegal!";
  }
}

SomeContext:find b {
  print("%.0f\n", b);
}
```

tests/fail-return-in-ctx-string.eq

```
SomeContext = {
  b = { "Catch This";}
}

SomeContext:find b {
  print("%.0f\n", b);
}
```

tests/fail-return-in-cxt-nested.eq

```
SomeContext = {
  a = { 42.333; }
  b = { if (1){
        3+81;
      }
      else{
        if (4>3){
          cos(20);
        }
        else{
        }
      }
    }
}

SomeContext:find b {
  print("%.0f\n", b);
}
```

tests/fail-return-in-cxt-no-else.eq

```
SomeContext = {
  a = { 42.333; }
  b = { if (1){
        3+81;
      }
      else{
        if (4>3){
          cos(20);
        }
      }
    }
}

SomeContext:find b {
  print("%.0f\n", b);
}
```

tests/fail-return-in-find.eq

```
SomeContext = {
  a = { 42.333; }
}

SomeContext:find a {
  a;
  print("%.0f\n", -3);
}
```

tests/fail-return-in-find-while.eq

```
SomeContext = {
  a = { 42.333; }
}

SomeContext:find a {
  while(1){
    3+81;
    break;
  }
  print("%.0f\n", 42+42);
}
```

tests/fail-sin-illegal-arg-assign.eq

```
SomeContext = {  
  a = { 42.333; }  
}  
  
SomeContext:find a {  
  sin(a=8);  
}
```

tests/fail-sin-illegal-arg-str.eq

```
SomeContext = {  
  a = { 42.333; }  
}  
  
SomeContext:find a {  
  sin("abc");  
}
```

tests/fail-sqrt-illegal-arg-assign.eq

```
SomeContext = {  
  a = { 42.333; }  
}  
  
SomeContext:find a {  
  sqrt(a=8);  
}
```

tests/fail-sqrt-illegal-arg-str.eq

```
SomeContext = {  
  a = { 42.333; }  
}  
  
SomeContext:find a {  
  sqrt("abc");  
}
```

tests/fail-sqrt-less-zero.eq

```
SomeContext = {  
  a = { 42.333; }  
}  
  
SomeContext:find a {  
  sqrt(-42);  
}
```

tests/fail-sqrt-str-arg.eq

```
SomeContext = {
```

```
a = { 42.333; }  
  
}  
  
SomeContext:find a {  
  sqrt("abc");  
}
```

tests/fail-tan-illegal-arg-assign.eq

```
SomeContext = {  
  a = { 42.333; }  
}  
  
SomeContext:find a {  
  tan(a=8);  
}
```

tests/fail-tan-illegal-arg-str.eq

```
SomeContext = {  
  a = { 42.333; }  
}  
  
SomeContext:find a {  
  tan("abc");  
}
```

tests/fail-undefined-variable.eq

```
TownCtx= {  
  people = {17;}  
}  
  
TownCtx:find acres {  
  print("to support the people we need %0.0f acres\n", acres);  
  /*error: acres not defined*/  
}
```

tests/fail-undef-var-with-def-target.eq

```
TownCtx= {  
  people = {17;}  
}  
  
FarmCtx = {  
  acres = {42;}  
}  
  
TownCtx:find people {  
  print("to support %0.0f people we need many acres\n", people);  
  print("to support the people we need %0.0f acres\n", acres); /* error: undefined acres */  
}
```

tests/fail-var-defined-in-diff-ctx.eq

```
TownCtx= {  
  people = {17;}  
}
```

```

}

FarmCtx = {
  acres = {42;}
}

TownCtx:find acres {
  print("to support the people we need %0.0f acres\n", acres);/*error: wrong context*/
}

```

tests/fail-with-argument-missing-semi.eq

```

SomeCtx = {
  a = { 42; }
  b = { 32; }
}

SomeCtx:find a with b =17 { /* missing semicolon after b = 17 */
  print("%0.0f\n", a);
}

```

tests/test-absolutevalue.eq

```

SomeCtx = {
  a = { -52; }
}

SomeCtx:find a {
  print("the value of a is %0.f\n", a);
  print("the value of a %% 3 is %0.f\n", a % 3);
  print("the value of | a %% 3 | is %0.f\n", | a % 3 |);
  print("the value of | a %% 3 | + 2 is %0.f\n", | a % 3 | + 2);
  print("the value of - ( | a %% 3 | + 2 ) is %0.f\n", - ( | a % 3 | + 2 ));
}

```

tests/test-arithmetic-basic.eq

```

BasicMaths = {
  alpha = { 3; }
}

BasicMaths:find alpha {
  print("alpha(%0.f) squared is %0.f\n", alpha, alpha ^ 2);
  print("alpha minus %0.f is %0.f\n", 2, alpha - 2);
  print("alpha plus alpha is %0.f\n", alpha + alpha);
  print("alpha divided by %0.f is %0.2f\n", 2, alpha / 2);
  print("alpha modulo %0.f is %0.f\n", 2, alpha % 2);
  print("negative alpha is %0.f\n", -alpha);

  print("1 is true, 0 is false\n");
  print("alpha negated is %0.f\n", !alpha);
  print("alpha double negated is %0.f\n", !!alpha);

  print("alpha greater than %0.f is %0.f\n", 2, alpha > 2);
  print(
    "alpha greater than or equal to %0.f is %0.f\n",
    2, alpha >= 2);

  print("alpha less than %0.f is %0.f\n", 2, alpha < 2);
  print(
    "alpha less than or equal to %0.f is %0.f\n",
    2, alpha <= 2);

  print(
    "alpha times %0.f plus %0.f is %0.f\n",
    2, 1, alpha * 2 + 1);
}

```

tests/test-break.eq

```
SomeContext = {
  a={1;}
}
SomeContext: find a{
  while(a<3){
    print("%.0f\n",a);
    break;
  }
}
```

tests/test-built-in-cos.eq

```
SomeContext = {
  a = { 42; }
}
SomeContext:find a {
  print("%.2f\n", cos(a));
}
```

tests/test-built-in-log.eq

```
SomeContext = {
  a = { 42; }
}
SomeContext:find a {
  print("%.2f\n", log(a));
}
```

tests/test-built-in-sin.eq

```
SomeContext = {
  a = { 42; }
}
SomeContext:find a {
  print("%.2f\n", sin(a));
}
```

tests/test-built-in-sqrt.eq

```
SomeContext = {
  a = { 42; }
}
SomeContext:find a {
  print("%.2f\n", sqrt(a));
}
```

tests/test-built-in-tan.eq

```
SomeContext = {
```



```
a = { 42; }  
  
}  
  
SomeContext:find a {  
  print("%.2f\n", tan(a));  
}
```

tests/test-continue.eq

```
SomeContext = {  
  a={1;}  
}  
SomeContext: find a{  
  while(a<4){  
    print("%.0f\n",a);  
    a=a+1;  
    continue;  
    print("%.0f\n",a);  
  }  
}
```

tests/test-dependency-resolved-inside-function.eq

```
MyCtx = {  
  a = {  
    internalVar = 10;  
    internalVar + 1;  
  }  
}  
  
MyCtx: find a {  
  print("a = %0.f\n", a);  
}
```

tests/test-double-dependency-bug.eq

```
Foo = {  
  twice = b + b;  
}  
  
Foo:find twice {  
  b = 10;  
  print("twice = %0.f [b = %0.f]\n", twice, b);  
}
```

tests/test-else.eq

```
SomeContext = {  
  a = { 42.333; }  
}  
  
SomeContext:find a {  
  if (3>4){  
    a = 3;  
  
  }  
  else if (3>4){  
    a = 4;  
  }  
  else if (3>4){  
    a = 4;  
  
  }  
  else if (3>4){
```

```

    a = 4;
  }
  else{
    a =0;
    print("%.0f\n", a);
    print("%.0f\n", a + 1);
    print("%.0f\n", a + 2);
  }
  print("%.0f\n", a);
}

```

tests/test-else-if.eq

```

SomeContext = {
  a = { 42.333; }
}

SomeContext:find a {
  if (3>4){
    a = 3;
  }
  else if (4>3){
    a = 4;
    print("%.0f\n", a);
    print("%.0f\n", a + 1);
    print("%.0f\n", a + 2);
  }
  else if (4>3){
    a = 4;
  }
  else if (4>3){
    a = 4;
  }
  else{
    a =0;
  }
  print("%.0f\n", a);
}

```

tests/test-findblk-without-ctx.eq

```

myVal = 42;
globalVal = 32; /* in the "global" context */

/* `find` doesn't prefix with a "context" */
find myVal {
  print("myVal is defined on the global context as %.0f\n", myVal);
  print("globalVal is defined on the global context as %.0f\n", globalVal);
}

find globalVal {
  print("globalVal is defined on the global context as %.0f\n", globalVal);
}

```

tests/test-find-decl-assignment.eq

```

Foo = {
  a = { 40; }
}

Foo:find a {
  b = 2;
  print("a + b is %.0f\n", a + b);
}

```

tests/test-find-noargs.skip.eq

```
find {
  print("zomg printing and i don't care about variables!\n");
}
```

tests/test-global-variable.eq

```
b = 23,
c = 1;

SomeContext = {
  a=1;
}

SomeContext: find a{
  print("%.0f\n",a);
  print("%.0f\n",c);
}
```

tests/test-global-variable-overwrite.eq

```
b = 23,
c = 1;
a = 4;

find a {
  a = 1;
}

find a{
  print("%.0f\n",a);
  print("%.0f\n",c);
}
```

tests/test-header-in-if.eq

```
SomeContext = {
  a={1;}
}
SomeContext: find a {
  if(a^2==1){
    print("%.0f\n",a);
    print("%.0f\n",a + 1);
  }else{
    print("%.0f\n",a + 2);
  }
}
```

tests/test-helloworld.eq

```
SomeContext = {
  a = { 42.333; }
}

SomeContext:find a {
  print("%.0f\n", a);
}
```

tests/test-if.eq

```

SomeContext = {
  a={1;}
}
SomeContext: find a {
  if (a==1){
    print("%.0f\n",a);
    print("%.0f\n",a + 1);
  }else{
    print("%.0f\n",a + 2);
  }
}

```

tests/test-iterative-gcd.eq

```

Gcd = {
  gcd = {
    a= 10;
    b=20;
    while (a != b) {
      if (a > b) {a = a - b;}
      else {b = b - a;}
    }
    a;
  }
}
Gcd:find gcd {
  print("gcd between 10 and 20 is %.0f\n", gcd);
}

```

tests/test-lazyresolved-vars.eq

```

SomeCtx = {
  a = { b + 40; }
  b = { 2 ^ c + 5; }
  c = { 5; }
  f = { 1/3; } /* never used */
}

SomeCtx:find a {
  d = 100; /* never used */
  print("a = %.0f (when b = %.0f)\n", a, b);

  b = 2;
  /* now: a depends on b which is independent */
  print("a = %.0f (when b = %.0f)\n", a, b);
}

/***** EXPECTED OUTPUT *****/
#include <math.h>
#include <stdio.h>

double SomeCtx_a_0(double b) {
  return (double) (b + 40.);
}

double SomeCtx_b_1(double c) {
  return (double) (pow(2., c) + 5.);
}

double SomeCtx_c_2 = (double) (5.);

double SomeCtx_f_3 = (double) (1. / 3.);

void find_SomeCtx_0() {
  double f;
  double c;
  double b;
  double a;
  double d;
}

```

```

c = SomeCtx_c_2;
b = SomeCtx_b_1(c);
a = SomeCtx_a_0(b);
f = SomeCtx_f_3;
d = 100.;

printf("a = %.0f (when b = %.0f)\n", (double) (a), (double) (b));

b = 2.;
a = SomeCtx_a_0(b);

printf("a = %.0f (when b = %.0f)\n", (double) (a), (double) (b));
}

void find_SomeCtx_0_range(){
    find_SomeCtx_0();
}

int main() {
    find_SomeCtx_0_range ();
    return 0;
}
*/

```

tests/test-lazyresolved-vars-increment-dependent-self.eq

```

Foo = {
    b = { c + 3; }
}

Foo: find b {
    c = 3; /* b == 6 */

    print("`b` is %.f\n", b);
    b = b + 1; /* b == 7 */
    print("`b = b + 1` is %.f\n", b);
    b = b + 3; /* b == 10 */
    print("`b = b + 3 is %.f\n", b);
}

```

tests/test-lazyresolved-vars-increment-self.eq

```

Foo = {
    a = { 1; }
}

Foo: find a {
    while (a < 3) {
        print("a=%.0f\n", a);
        a = a + 1;
    }
    d = 0;
    while (d < 3) {
        a = d = d + 1;
        print("a=d=%.0f\n", a);
    }
}

```

tests/test-lazyresolved-vars-nested-assignment.eq

```

Foo = {
    a = { 3; }
}

```

```
Foo:find a {
  x = y = 3; /* y should be marked resolved before evaluated against x */

  print("x=%0.f\n", x);
}
```

tests/test-lazyresolved-vars-with-cos.eq

```
MyCtx = {
  a = { c + cos(b); }
}

MyCtx: find a {
  c = 1;
  b = 0;
  print("%.0f", a);
}
```

tests/test-mod.eq

```
SomeCtx = {
  a = { 42; }
  b = { 99; }
}

SomeCtx:find a {
  print("%.0f\n", a % 2);
}
```

tests/test-multieq-print.eq

```
SomeContext = {
  a = { print("42\n");
        42;
      }
}

SomeContext:find a {
  print("%.0f\n", a);
}
```

tests/test-multi-equation.eq

```
SomeContext = {
  a = {
    if (3>4){
    }
    0;
  }
}

SomeContext: find a {
}
```

tests/test-multiple-context-per-var.eq

```
Foo0 = {
  a = { 0; }
}
```

```

Foo1 = {
  a = { 1; }
}

Foo2 = {
  a = { 2; }
}

Foo1: find a {
  print("%.0f\n", a);
}

```

tests/test-negsign.eq

```

SomeContext = {
  a = { 42.333; }
}

SomeContext:find a {
  print("%.0f\n", -a);
  print("%.0f\n", - 1);
  print("%.4f\n", - 1.2e-3);
  print("%.4f\n", - -1.2e-3);
  print("%.4f\n", - 1.2e-3 --0.27e10);
  print("%.4f\n", a --0.27e10);
  print("%.0f\n", - a);
  print("%.0f\n", 1 - -a);
  print("%.0f\n", 1 --a);
  print("%.0f\n", a+1);
  print("%.0f\n", a+ -1);
  print("%.0f\n", 1 + a);
}

```

tests/test-nested-builtin.eq

```

SomeContext = {
  a = { 42.333; }
}

SomeContext:find a {
  a = tan(-sin(-sqrt(-log(cos(30)))));
  print("%.2f\n", a);
}

```

tests/test-number.eq

```

SomeCtx = { a = { 42; } }

SomeCtx:find a {
  print("%.0f\n", a);
  print("%.5f\n", 4.2e-4 );
  print("%.2f\n", 0.42 );
  print("%.2f\n", .42 );
  print("%.1f\n", 0e1 );
  print("%.0f\n", 4.2e4 );
  print("%.0f\n", -42 );
  print("%.5f\n", -4.2e-4);
  print("%.2f\n", -0.42 );
  print("%.2f\n", -.42 );
  print("%.1f\n", -0e1 );
  print("%.0f\n", -4.2e4 );
  print("%f\n", 5 * -4.2e-4);
}

```

tests/test-overwritten-lazyresolved-vars.eq

```
MyCtx = {
  a = { b + 5; }
}

MyCtx: find a {
  b = 5;
  print("a = %.0f (when b = %.0f)\n", a, b);

  b = 20;
  print("a = %.0f (when b = %.0f)\n", a, b);

  c = 100;
  a = c;
  print("a = c = %.0f\n", a);
}
```

tests/test-plus.eq

```
SomeContext = {
  a = {1;}
  /* a = {a/5;} */
}
SomeContext: find a {
  print("%.0f\n", a + 5);
}
```

tests/test-pow.eq

```
SomeCtx = {
  a = { 2; }
  b = { 9; }
}

SomeCtx:find a {
  print("%.0f\n", a ^ 2);
  print("%.0f\n", b ^ 0.5);
}
```

tests/test-pow-order-of-ops.eq

```
Foo = {
  a = { 2; }
  b = { 3; }
}

Foo:find a {
  print("a ^ b ^ 2 = %.0f\n", a ^ b ^ 2);
}
```

tests/test-presentation.eq

```
MyCtx = {
  a = { b + d ^ 2; }
}

d = 5;

MyCtx: find a {
  b = 0;
  print("a = %.0f\n", a);
}
```



```

b = 5;
d = 2;
print("a = %.0f\n", a);

c = 100;
a = c;
print("a = c = %.0f\n", a);
}

```

tests/test-print-basic.eq

```

FarmTownCtx = {
  acres = { 42; }
  population = { 99; }
}

FarmTownCtx:find population {
  print("%.0f people live in this in town\n", population);
  print("The %.2f acres of crops is just enough\n", acres);
}

```

tests/test-print-findseperate.eq

```

Fool = {
  a = { 1; }
}

Fool: find a {
  print("previous a = %.0f\n", a);
  a = 3;
  print("after a = %.0f\n", a);
}

Fool: find a {
  print("previous a = %.0f\n", a);
  a = 5;
  print("after a = %.0f\n", a);
}

```

tests/test-print-multi-find.eq

```

TownCtx = {
  population = { 99; }
}

FarmCtx = {
  acres = { 42; }
}

FarmCtx:find acres {
  print("The %.2f acres of crops is just enough\n", acres);
}

TownCtx:find population {
  print("to support the %.0f people living in this in town\n", population);
}

```

tests/test-range-dependents-bug.eq

```

Pendulum = {
  magiceq = eqparam;
}

Pendulum:find magiceq with eqparam in range(5); {
  print("magiceq: %.0f\n", magiceq);
}

```

```
}
```

tests/test-range.eq

```
SomeCtx = {
  a = { 42; }
  b = { 32; }
}

SomeCtx:find a {
  print("print for simple find\n");
  print("a = %0.0f\n", a);
  print("b = %0.0f\n", b);
}

SomeCtx:find a with c in range(0,3,1); {
  print("print for find with range (0,3,1)\n");
  print("a = %0.0f\n", a);
  print("b = %0.0f\n", b);
  print("c = %0.0f\n", c);
}

SomeCtx:find a with c in range(2,-1,-1); {
  print("print for find with range (2,-1,-1)\n");
  print("a = %0.0f\n", a);
  print("b = %0.0f\n", b);
  print("c = %0.0f\n", c);
}

SomeCtx:find a with c in range(-1,-1, 1); {
  print("print for find with range (-1,-1,1)\n");
  print("a = %0.0f\n", a);
  print("b = %0.0f\n", b);
  print("c = %0.0f\n", c);
}

SomeCtx:find a with b = 10; c in range(0,4,2); {
  print("print for find with range (0,4,2)\n");
  print("a = %0.0f\n", a);
  print("b = %0.0f\n", b);
  print("c = %0.0f\n", c);
}

SomeCtx:find a with b = 10; c in range(0,2); {
  print("print for find with range (0,2)\n");
  print("a = %0.0f\n", a);
  print("b = %0.0f\n", b);
  print("c = %0.0f\n", c);
}

SomeCtx:find a with b = 10; c in range(2); {
  print("print for find with range (2)\n");
  print("a = %0.0f\n", a);
  print("b = %0.0f\n", b);
  print("c = %0.0f\n", c);
}

/** EXPECTED OUTPUT
#include <stdio.h>

double SomeCtx_a_0 () {
  return (double) (42.);
}

double SomeCtx_b_1 () {
  return (double) (32.);
}

void find_SomeCtx_0(double c) {
  // if it's a range, then `c` is used as a function argument instead => no declaration for `c`
  // double c;
  // TODO: check if there is any other places that affected by `c` being an argument
  double b;
  double a;

  b = SomeCtx_b_1();
  a = SomeCtx_a_0();
```

```

//-----gen_finddecl_stmt-----
b = 10.;
printf("print for find with range (2)\n");
printf("a = %0.0f\n", (double) (a));
printf("b = %0.0f\n", (double) (b));
printf("c = %0.0f\n", (double) (c));
}

// some other stuff
*/

```

tests/test-recursive-gcd.skip.eq

```

Gcd = {
  gcd = {
    if (b == 0) { a; }
    else if (a == 0) { b; }
    else if (a == b) { a; }

    if (a > b) {
      a = b;
      b = a % b;
    }
    else {
      a = b % a;
      b = a;
    }
  }
  gcd;
}

Gcd:find gcd {
  a = 10;
  b = 20;
  print("gcd between %0.f and %0.f is %0.f\n", a, b, gcd);
}

```

tests/test-return-builtin.eq

```

SomeContext = {
  a = {
    cos(42);
  }
  b = {
    log(42);
  }
  c = {
    sin(42);
  }
  d = {
    tan(42);
  }
  e = {
    sqrt(42);
  }
}

SomeContext:find a {
  print("%.2f\n", a);
  print("%.2f\n", b);
  print("%.2f\n", c);
  print("%.2f\n", d);
  print("%.2f\n", e);
}

```

tests/test-return-cxt.eq

```

SomeContext = {
  a={ if(1){
    40;}
    else{
    1;}
  }
}
SomeContext: find a {
print("%.0f\n",a + 2);
}

```

tests/test-return-expression.eq

```

SomeContext = {
  a = {
    0;
  }
  b = {
    3 + 4;
  }
  c = {
    3 - 1;
  }
  d = {
    3 % 2;
  }
  e = {
    | - 42|;
  }
  f = {
    3 == 1;
  }
  h = {
    3 < 4;
  }
  i = {
    2 ^ 2;
  }
  j = {
    (3 + 4);
  }
  k = {
    |- ((3 + 4) / 2)^2 * ( 18 - 7 ) |;
  }
}

SomeContext:find a {
print("%.2f\n", a);
print("%.2f\n", b);
print("%.2f\n", c);
print("%.2f\n", d);
print("%.2f\n", e);
print("%.2f\n", f);
print("%.2f\n", h);
print("%.2f\n", i);
print("%.2f\n", j);
print("%.2f\n", k);
}

```

tests/test-return-in-cxt-if.eq

```

SomeContext = {
  a = { 42.333; }
  b = { if (1){
    cos(42)+log(7);
  }
    else{
    42;
  }
  }
}

```

```
SomeContext:find b {
  print("%.0f\n", b);
}
```

tests/test-return-in-cxt-nested.eq

```
SomeContext = {
  a = { 42.333; }
  b = { if (1){
        3+81;
      }
      else{
        if (4>3){
          cos(20);
        }
        else{
          /* missing a return here */
        }
        sqrt(30); /* but this one covers it */
      }
    }
}

SomeContext:find b {
  print("%.0f\n", b);
}
```

tests/test-simple-equation.eq

```
SomeContext={
  a = 40 + 2;
}

SomeContext:find a {
  print("%.0f\n", a);
}
```

tests/test-single-line-eq-in-cxt.eq

```
SomeContext = {
  a = 42.333;
  b = 41.333;
  c = 40.333;
}

SomeContext:find a {
  print("%.0f\n", a);
  print("%.0f\n", b);
  print("%.0f\n", c);
}
```

tests/test-var-appear-multiple-times.eq

```
SomeContext = {
  a = { 42.22; }
  a = { 25; }
}

SomeContext:find a {
  print("%.0f\n", a);
}
```

tests/test-while.eq

```
Foo = {
  a = { 1; }
}

Foo: find a {
  while (a < 3) {
    print("%.0f\n", a);
    a = 3;
  }
}
```

tests/test-with-multi-var.eq

```
SomeCtx = {
  a = { 42; }
  b = { 32; }
  c = { 22; }
}

SomeCtx:find a with b =17; c = 7; {
  print("%.0f\n", a);
  print("%.0f\n", b);
  print("%.0f\n", c);
}
```

tests/test-with-one-var.eq

```
SomeCtx = {
  a = { 42; }
  b = { 32; }
}

SomeCtx:find a with b =17; {
  print("%.0f\n", a);
  print("%.0f\n", b);
}
```

tests/test-absolutevalue.out

```
the value of a is -52
the value of a % 3 is -1
the value of | a % 3 | is 1
the value of | a % 3 | + 2 is 3
the value of - ( | a % 3 | + 2 ) is -3
```

tests/test-arithmetic-basic.out

```
alpha(3) squared is 9
alpha minus 2 is 1
alpha plus alpha is 6
alpha divided by 2 is 1.50
alpha modulo 2 is 1
negative alpha is -3
1 is true, 0 is false
alpha negated is 0
alpha double negated is 1
alpha greater than 2 is 1
alpha greater than or equal to 2 is 1
alpha less than 2 is 0
```

```
alpha less than or equal to 2 is 0
alpha times 2 plus 1 is 7
```

tests/test-break.out

```
1
```

tests/test-built-in-cos.out

```
-0.40
```

tests/test-built-in-log.out

```
3.74
```

tests/test-built-in-sin.out

```
-0.92
```

tests/test-built-in-sqrt.out

```
6.48
```

tests/test-built-in-tan.out

```
2.29
```

tests/test-continue.out

```
1
2
3
```

tests/test-dependency-resolved-inside-function.out

```
a = 11
```

tests/test-double-dependency-bug.out

```
twice = 20 [b = 10]
```

tests/test-else-if.out

```
4
5
6
4
```

tests/test-else.out

```
0
1
2
0
```

tests/test-findblk-without-ctx.out

```
myVal is defined on the global context as 42
globalVal is defined on the global context as 32
globalVal is defined on the global context as 32
```

tests/test-find-decl-assignment.out

```
a + b is 42
```

tests/test-find-noargs.out

```
zomg printing and i don't care about variables!
```

tests/test-global-variable.out

```
1
1
```

tests/test-global-variable-overwrite.out

```
4
1
```

tests/test-header-in-if.out

```
1
2
```

tests/test-helloworld.out

tests/test-if.out

```
1
2
```

tests/test-iterative-gcd.out

```
gcd between 10 and 20 is 10
```

tests/test-lazyresolved-vars-increment-dependent-self.out

```
`b` is 6
`b = b + 1` is 7
`b = b + 3 is 10
```

tests/test-lazyresolved-vars-increment-self.out

```
a=1
a=2
a=d=1
a=d=2
a=d=3
```

tests/test-lazyresolved-vars-nested-assignment.out

```
x=3
```

tests/test-lazyresolved-vars.out

```
a = 77 (when b = 37)
a = 42 (when b = 2)
```

tests/test-lazyresolved-vars-with-cos.out

```
2
```

tests/test-mod.out

```
0
```

tests/test-multieq-print.out

42
42

tests/test-multi-equation.out

tests/test-multiple-context-per-var.out

1

tests/test-negsign.out

-42
-1
-0.0012
0.0012
2699999999.9988
2700000042.3330
-42
43
43
43
41
43

tests/test-nested-builtin.out

1.49

tests/test-number.out

42
0.00042
0.42
0.42
0.0
42000
-42
-0.00042
-0.42
-0.42
-0.0
-42000
-0.002100

tests/test-overwritten-lazyresolved-vars.out

a = 10 (when b = 5)
a = 25 (when b = 20)
a = c = 100

tests/test-plus.out

6

tests/test-pow-order-of-ops.out

$a \wedge b \wedge 2 = 64$

tests/test-pow.out

4
3

tests/test-presentation.out

a = 25
a = 9
a = c = 100

tests/test-print-basic.out

99 people live in this in town
The 42.00 acres of crops is just enough

tests/test-print-findseperate.out

previous a = 1
after a = 3
previous a = 1
after a = 5

tests/test-print-multi-find.out

The 42.00 acres of crops is just enough
to support the 99 people living in this in town

tests/test-range-dependents-bug.out

magiceq: 0
magiceq: 1
magiceq: 2
magiceq: 3
magiceq: 4
magiceq: 5

tests/test-range.out

```
print for simple find
a = 42
b = 32
print for find with range (0,3,1)
a = 42
b = 32
c = 0
print for find with range (0,3,1)
a = 42
b = 32
c = 1
print for find with range (0,3,1)
a = 42
b = 32
c = 2
print for find with range (0,3,1)
a = 42
b = 32
c = 3
print for find with range (2,-1,-1)
a = 42
b = 32
c = 2
print for find with range (2,-1,-1)
a = 42
b = 32
c = 1
print for find with range (2,-1,-1)
a = 42
b = 32
c = 0
print for find with range (2,-1,-1)
a = 42
b = 32
c = -1
print for find with range (-1,-1,1)
a = 42
b = 32
c = -1
print for find with range (0,4,2)
a = 42
b = 10
c = 0
print for find with range (0,4,2)
a = 42
b = 10
c = 2
print for find with range (0,4,2)
a = 42
b = 10
c = 4
print for find with range (0,2)
a = 42
b = 10
c = 0
print for find with range (0,2)
a = 42
b = 10
c = 1
print for find with range (0,2)
a = 42
b = 10
c = 2
print for find with range (2)
a = 42
b = 10
c = 0
print for find with range (2)
a = 42
b = 10
c = 1
print for find with range (2)
a = 42
b = 10
c = 2
```

tests/test-recursive-gcd.out

gcd between 10 and 20 is 10

tests/test-return-builtin.out

-0.40
3.74
-0.92
2.29
6.48

tests/test-return-cxt.out

42

tests/test-return-expression.out

0.00
7.00
2.00
1.00
42.00
0.00
1.00
4.00
7.00
443.00

tests/test-return-in-cxt-if.out

2

tests/test-return-in-cxt-nested.out

84

tests/test-simple-equation.out

42

tests/test-single-line-eq-in-cxt.out

42
41
40

tests/test-var-appear-multiple-times.out

25

tests/test-while.out

1

tests/test-with-multi-var.out

42
17
7

tests/test-with-one-var.out

42
17