knode
a graph-based language

Project Manager: Krista Kohler
Language Guru: Jon Jia
System Architect: Jonathan Balsano
System Integrator: Maria Moresco
System Tester: Ruby Robinson

Imagine...
- You are a non-programmer who works with lots of data.
- You like the intuitive look of Python, but you don't like performance issues.
- You need the speed and efficiency of C without the headaches of pointers and memory management.

The Problem
- In our world, there is a LOT of data
- This data does not exist in a vacuum
- As our lives becomes more social, there's a greater need to access, share, and analyze interrelated data
- But data is not always easy to manage, especially in large quantities

The Solution: knode
- Declarative language focused on convenience
- Pretty syntax, snappy performance
- Speed of C, but memory managed
- Minimal programming experience required
- Built-in graph primitives for easy data viewing and manipulation

knode is...

A knode program

[illegible]

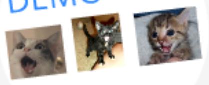
Node declarations

Edge declarations

String concatenation

Key Syntax

DEMO TIME



Project Management
- Traditional, five-phase development process
- Emphasis on collaboration and flexibility
- Weekly meetings: planning and working
- Asana for outline, task management, and deadlines
- "First-come, first-serve" assignment of responsibilities

Development
- Lex
- Yacc
- UTHash

Translator Architecture

Runtime Environment
- Output by GCC in machine code
- Just type ./a.out in *nix shell
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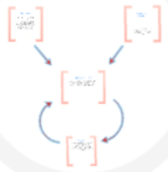

Conclusions
- Working on a group project has its challenges
- Cat GIFs make late-night pull requests fun!
- Great people, great product
- Knode is highly capable and easy to use
- Low level efficiency, higher level coding
- Manage interrelated data easily
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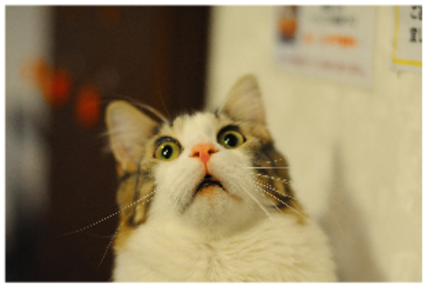

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user-friendly

convenient

fast

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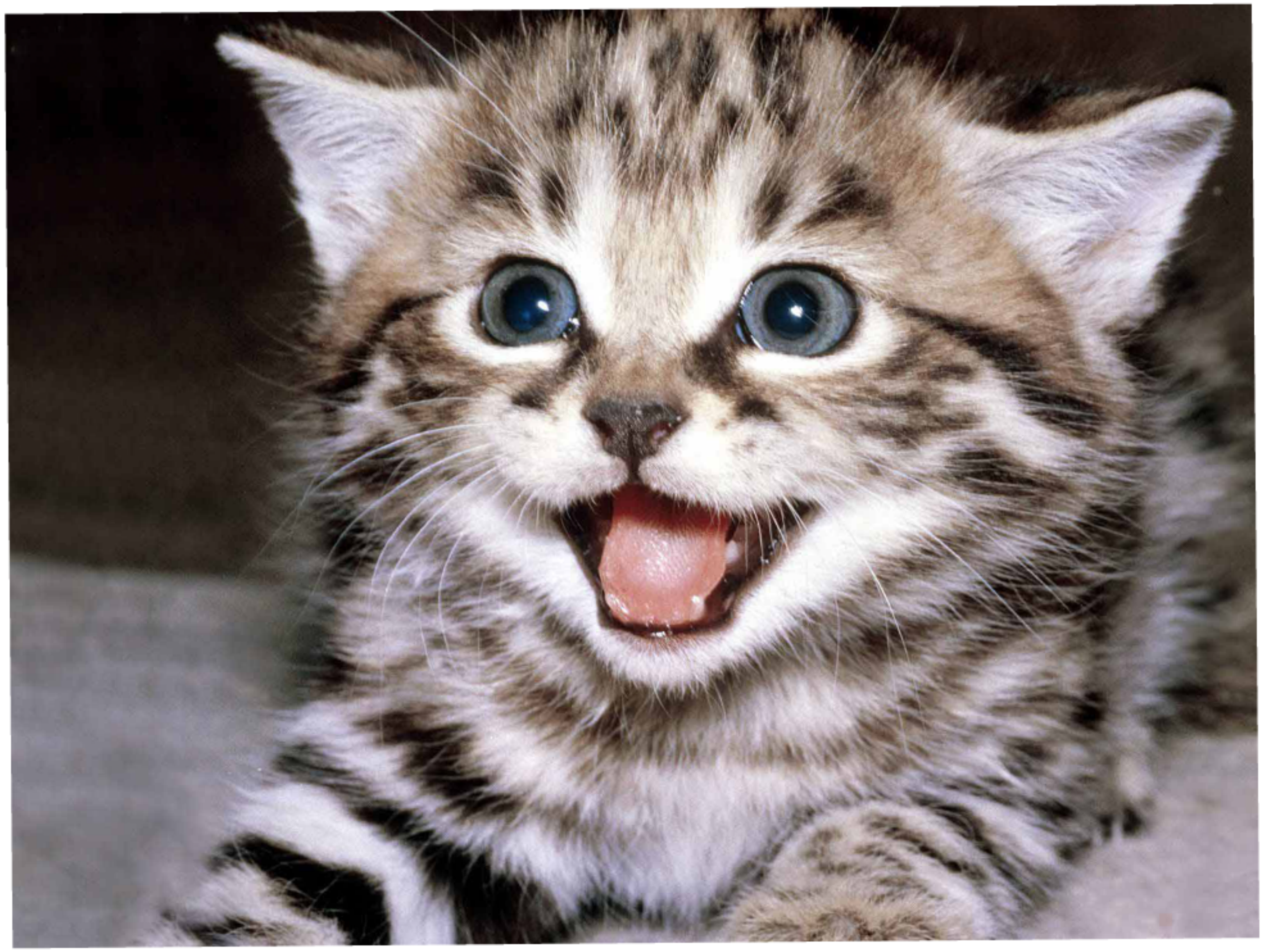

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Key Syntax

whitespace

- Two spaces used to denote blocks
- Used for:
  - Function definitions
  - Flow control
  - Certain declarations

```
main():
  node a
    role: "mammal"
  node b
    role: "dogs"
  node c
    role: "cats"
```

node

- Nodes are declared with keyword
- New block after declaration sets node data as dict

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- Keys and values are separated by colon
- Values must be strings

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edge

- Edges set as relation to two nodes
- Specified by ->, <-, <->
- Type of edge set with type keyword

```
edge p1 = [a->b]
edge p2 = [b->c]
edge p3 = [a->c]
p1.type = " type of "
p2.type = " type of "
p3.type = " hate "
```

string concatenation

- String concatenation is done with +
- Strings, ints, doubles can be all concatenated
- Create new string or print directly

```
print (b.role + " are a" + p1.type + a.role)
print (c.role + " are a" + p2.type + a.role)
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Memory Management

- "Memory management's a real b****"

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Prezi

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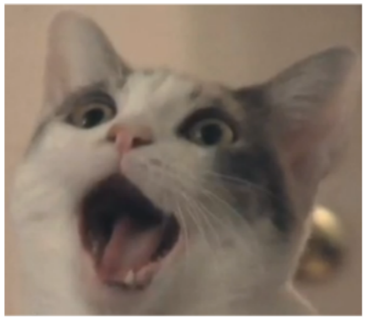

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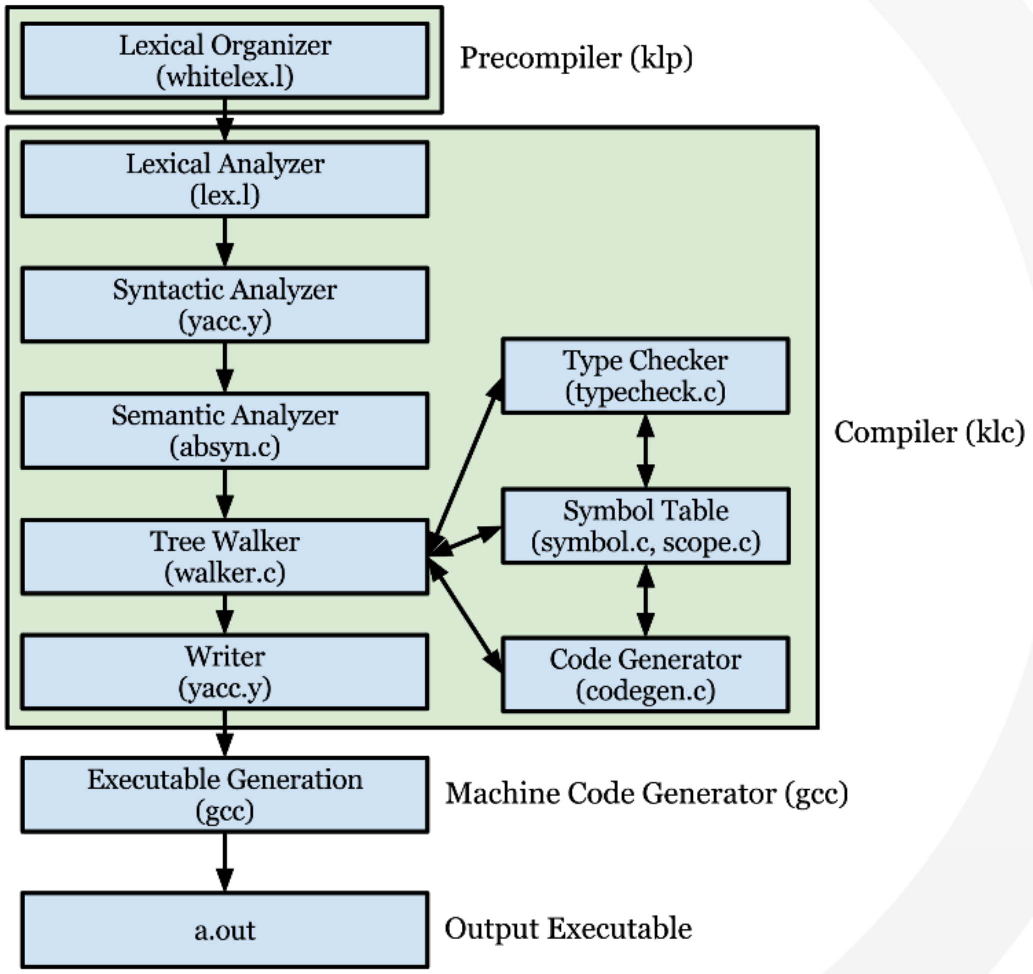
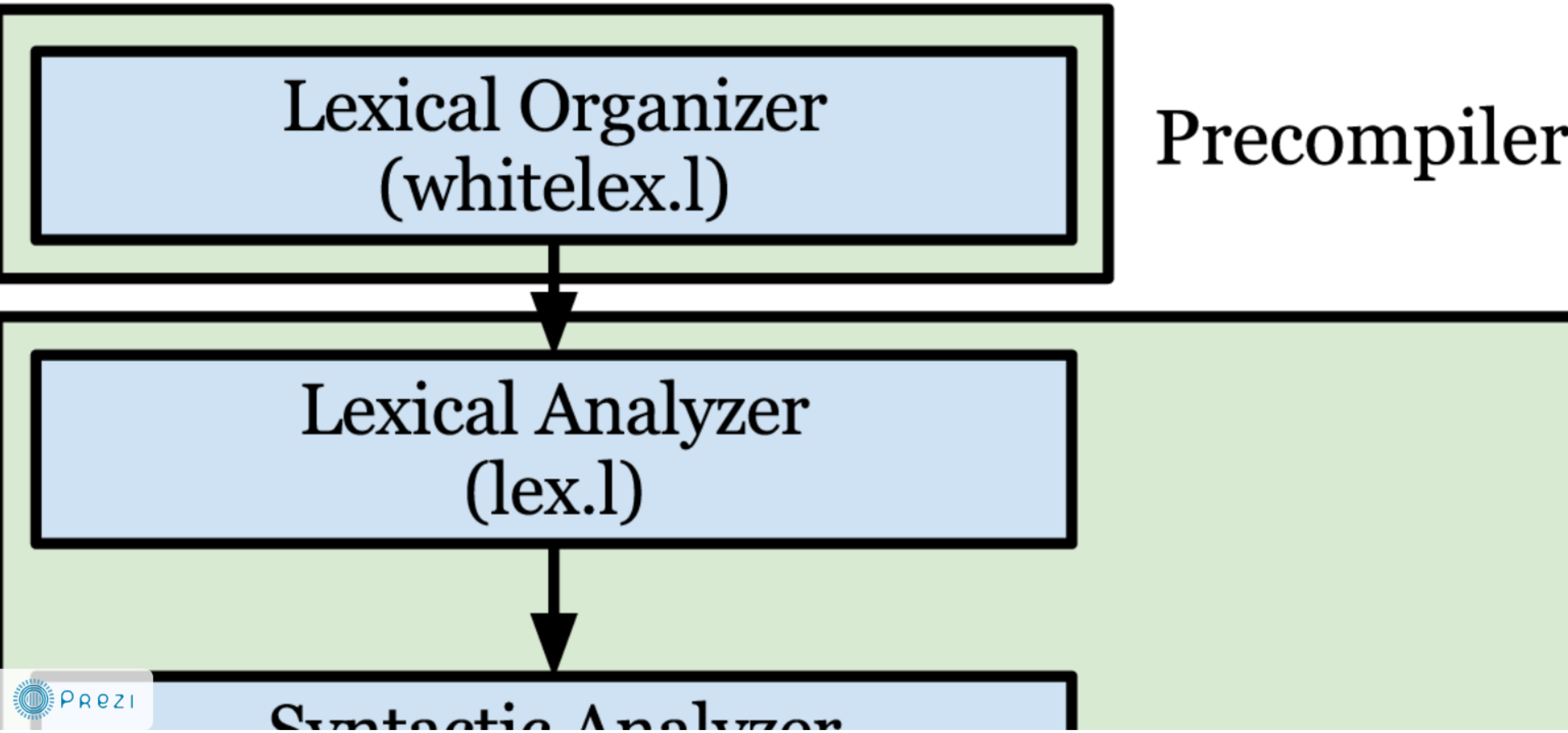
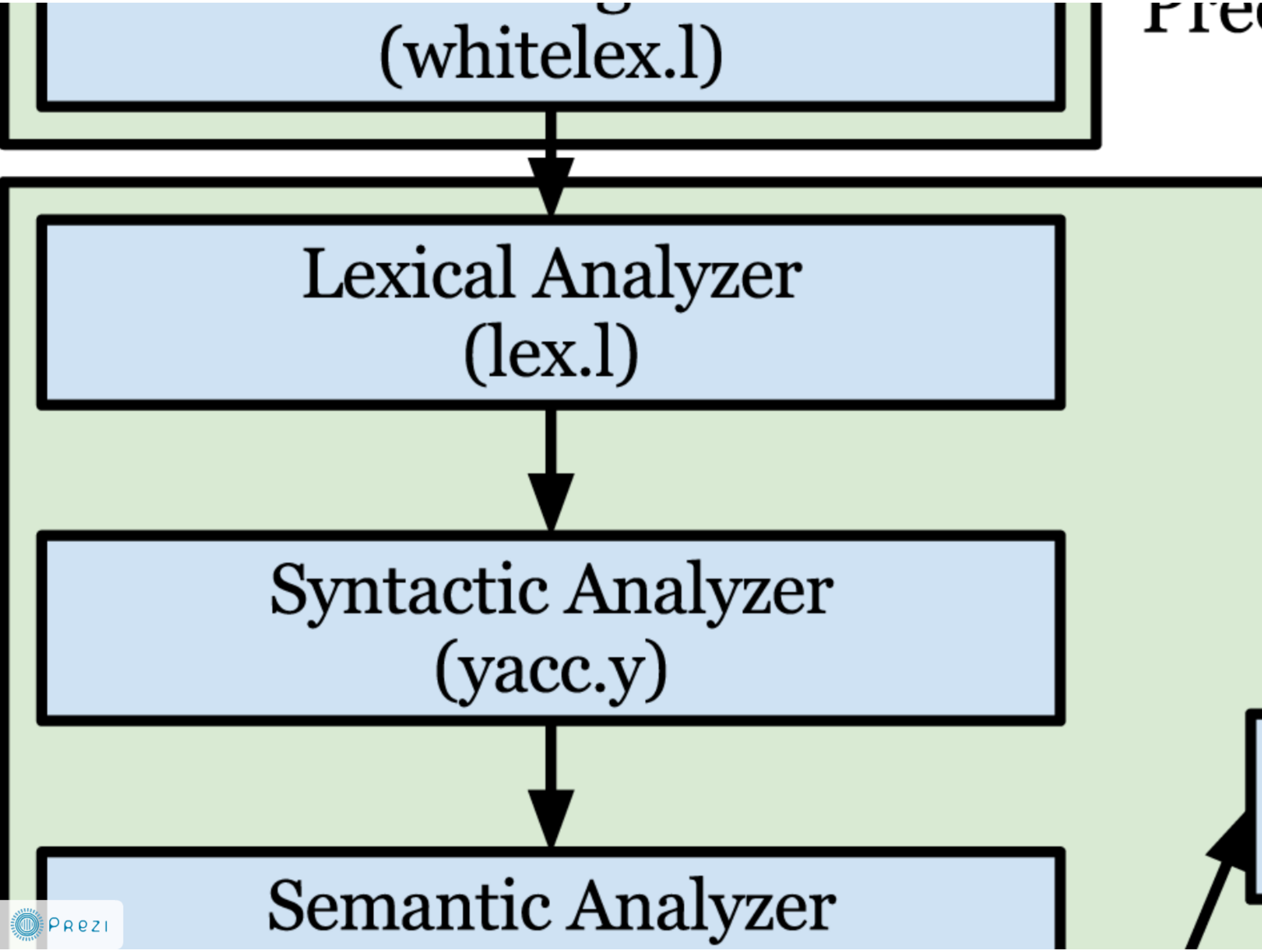


Lexical Organizer (whitelex.l)
Precompiler (klp)
Lexical Analyzer (lex.l)
Syntactic Analyzer (yacc.y)
Semantic Analyzer (absyn.c)
Tree Walker (walker.c)
Writer (yacc.y)
Type Checker (typecheck.c)
Symbol Table (symbol.c, scope.c)
Code Generator (codegen.c)
Compiler (klc)
Executable Generation (gcc)
Machine Code Generator (gcc)
a.out
Output Executable

Translator Archi

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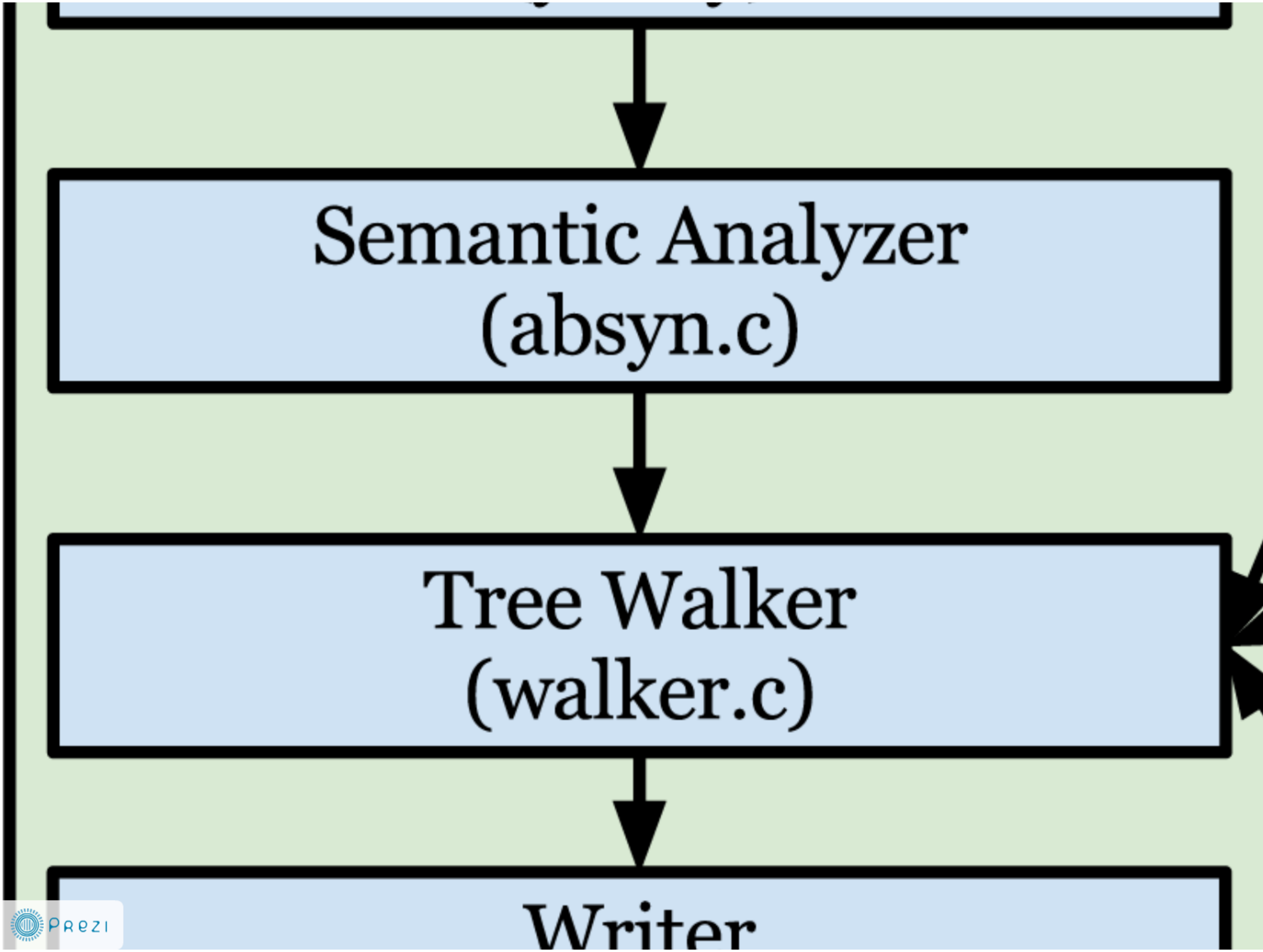
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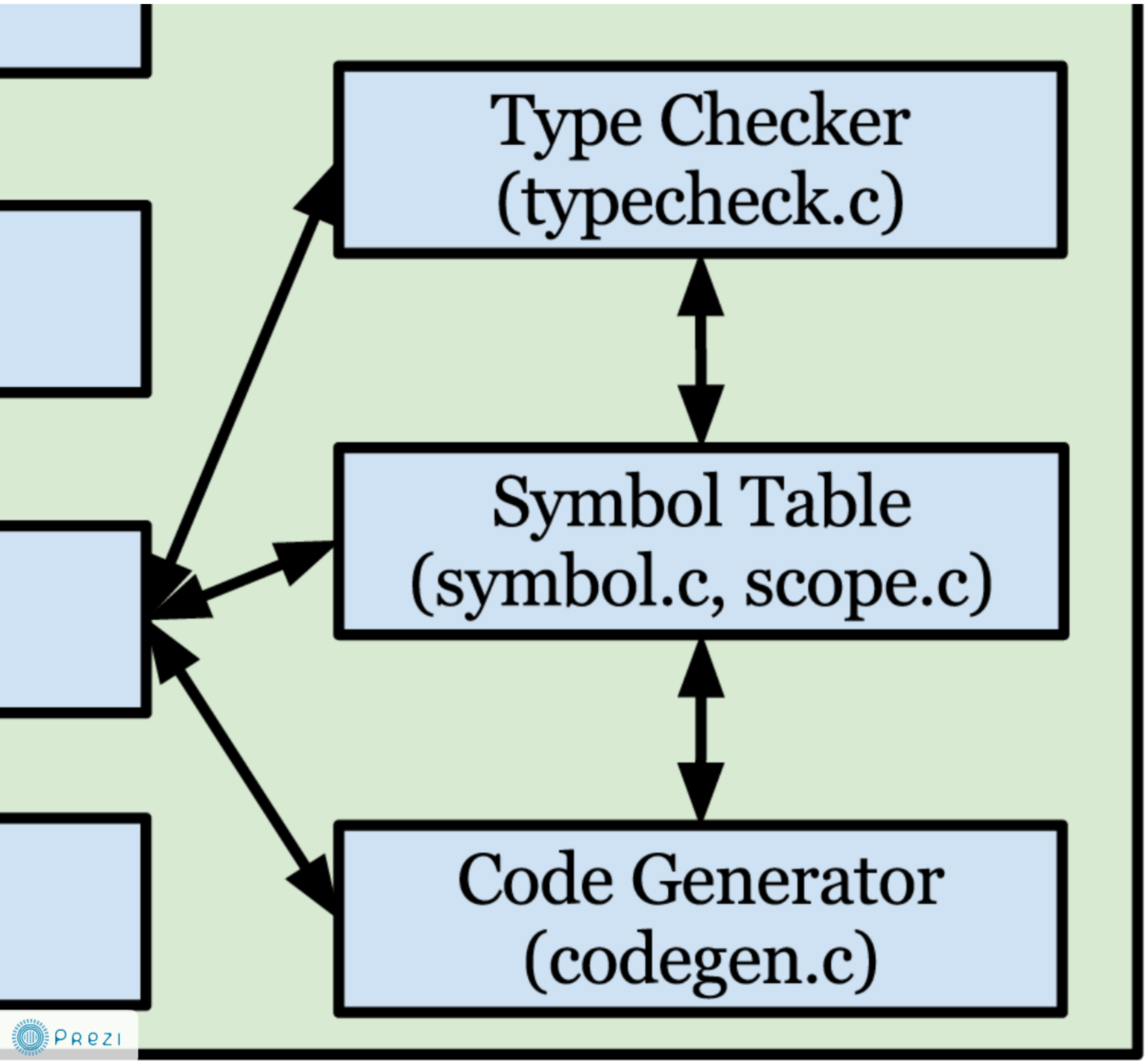
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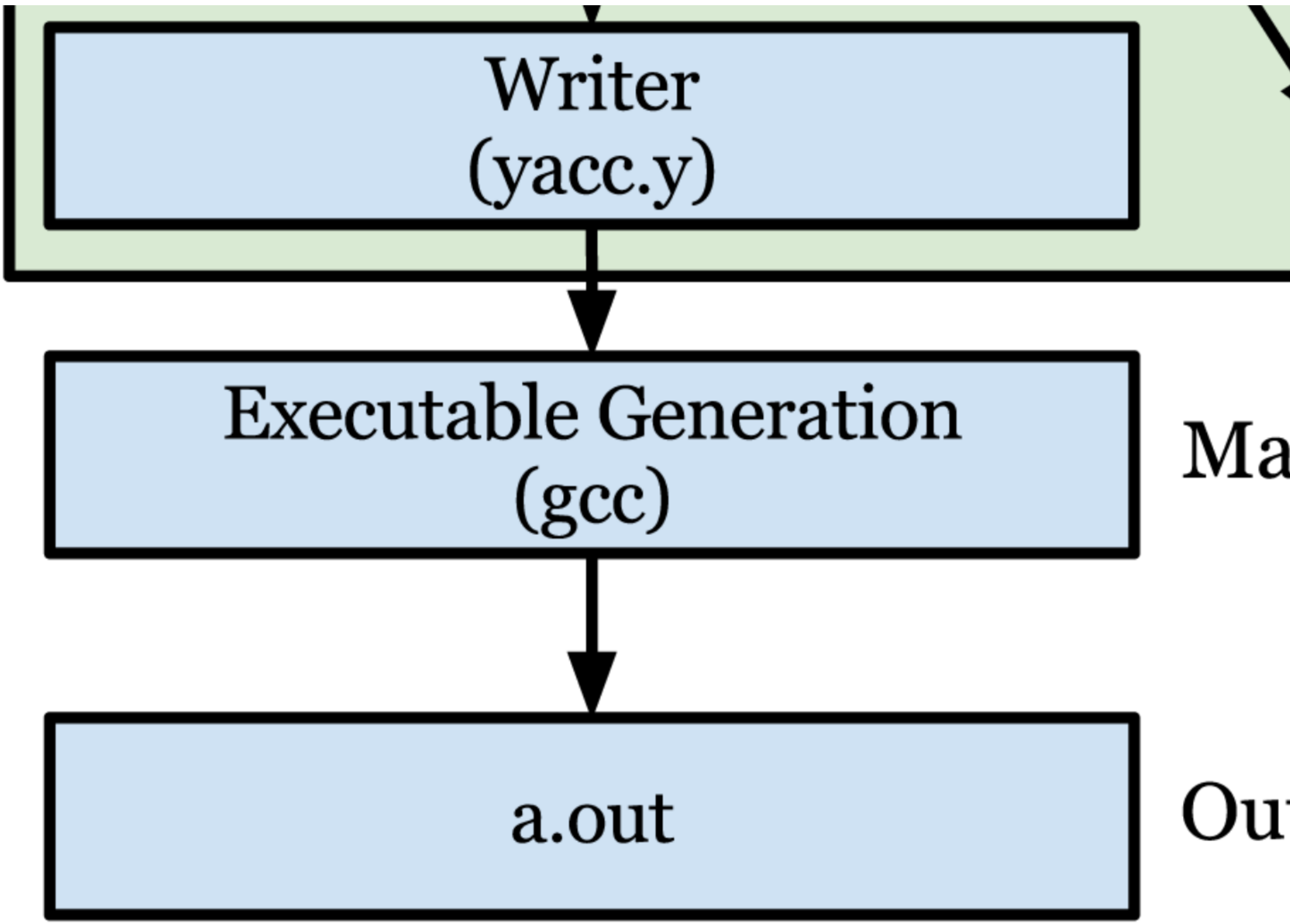

Prezi

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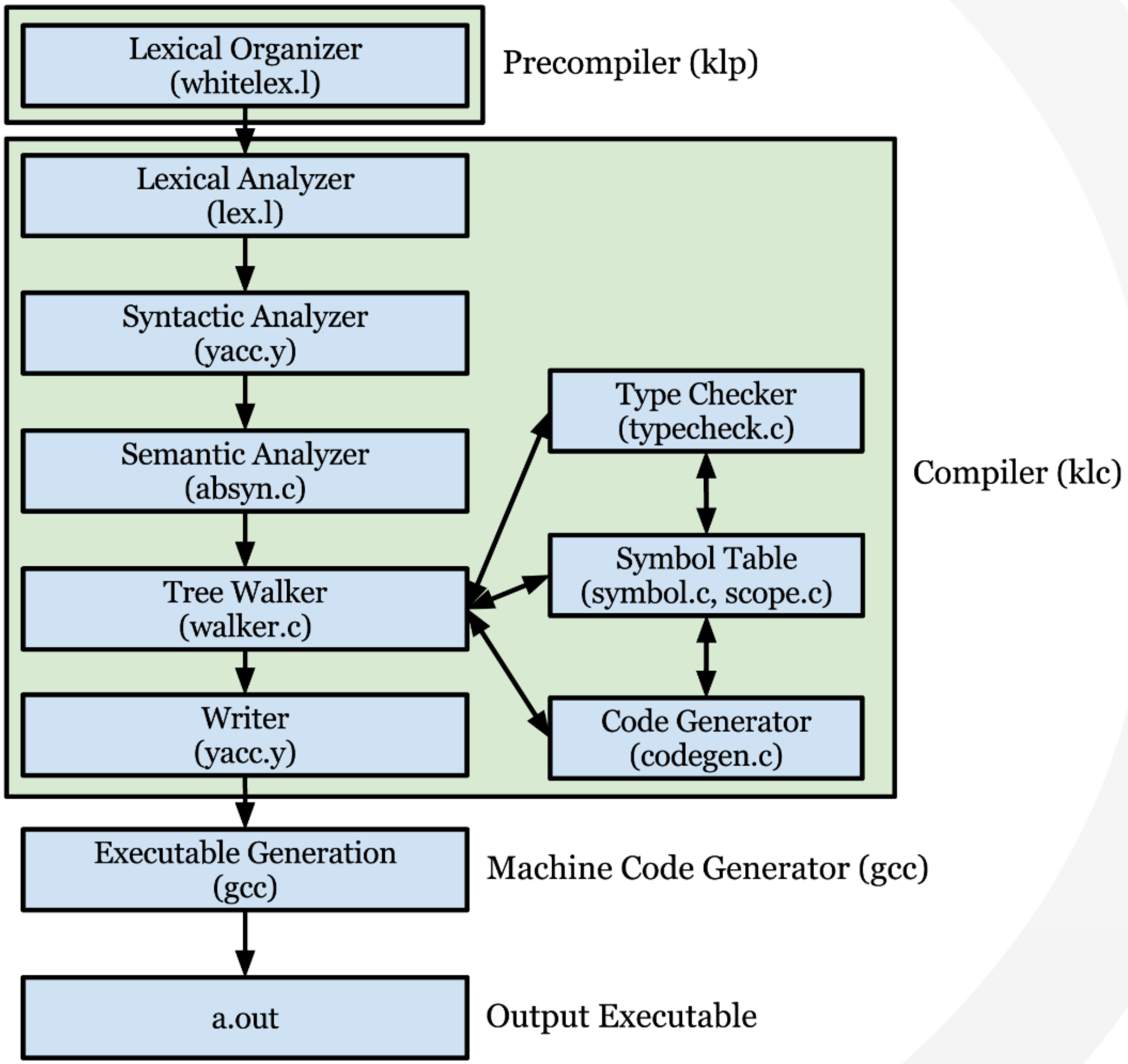

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Testing

Unit Testing

- Individual elements and types tested
- Each represented in .lin file
- Different outputs were produced during each stage of production depending on the compilation status of files at that stage

Integration Testing

- After unit tests were verified… .lin integration test files were written
- Same output methodology as unit tests

Regression Test Suite

- Shell script file iterated through all files in test suite
- Produced a log, output files, and errors from file
- Printed the status of each file (OK or FAILED)

Verification

- Verification process combined test plan and Github functionality
- Once all tests were passed it was possible to move on to other features
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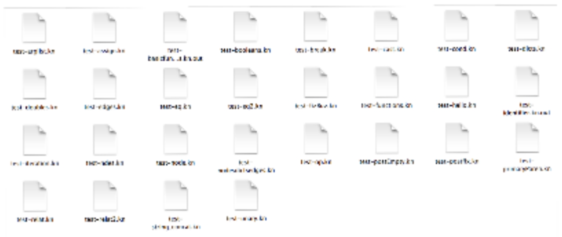

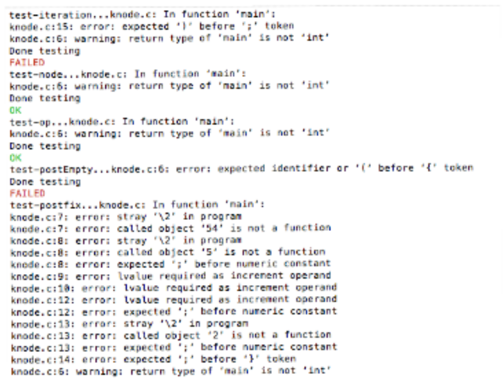

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knode.c:15: error: expected ')' before ';' token
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test-postEmpty...knode.c:6: error: expected identifier or '(' before '{' token
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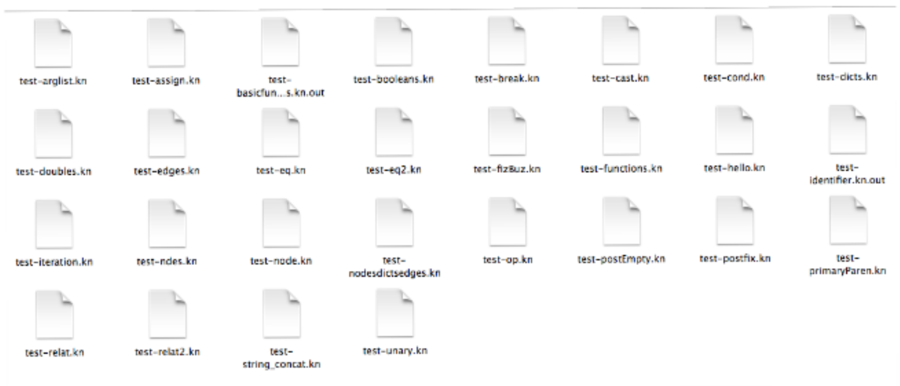

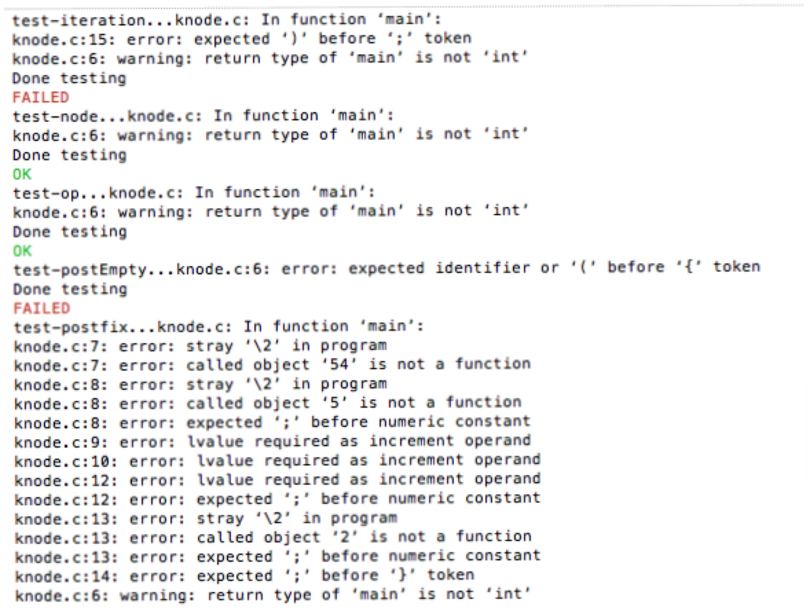

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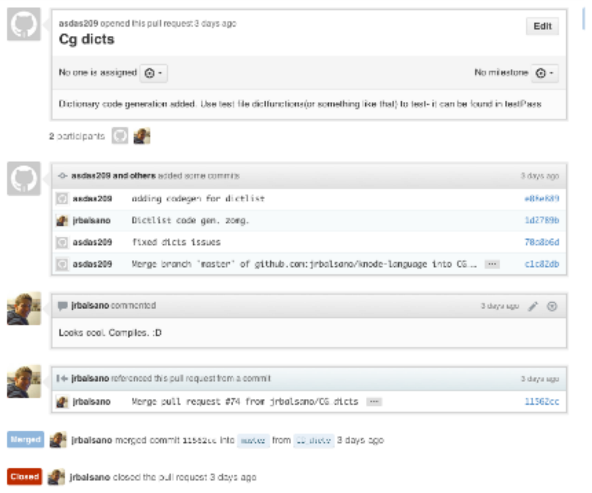


asdas209 opened this pull request 3 days ago

Edit

Cg dicts

No one is assigned | No milestone

Dictionary code generation added. Use test file dictfunctions(or something like that) to test- it can be found in testPass

2 participants

asdas209 and others added some commits — 3 days ago

asdas209	adding codegen for dictlist	e8fe889
jrbalsano	Dictlist code gen. zomg.	1d2789b
asdas209	fixed dicts issues	78c8b6d
asdas209	Merge branch 'master' of github.com:jrbalsano/knode-language into CG...	c1c82db

jrbalsano commented — 3 days ago

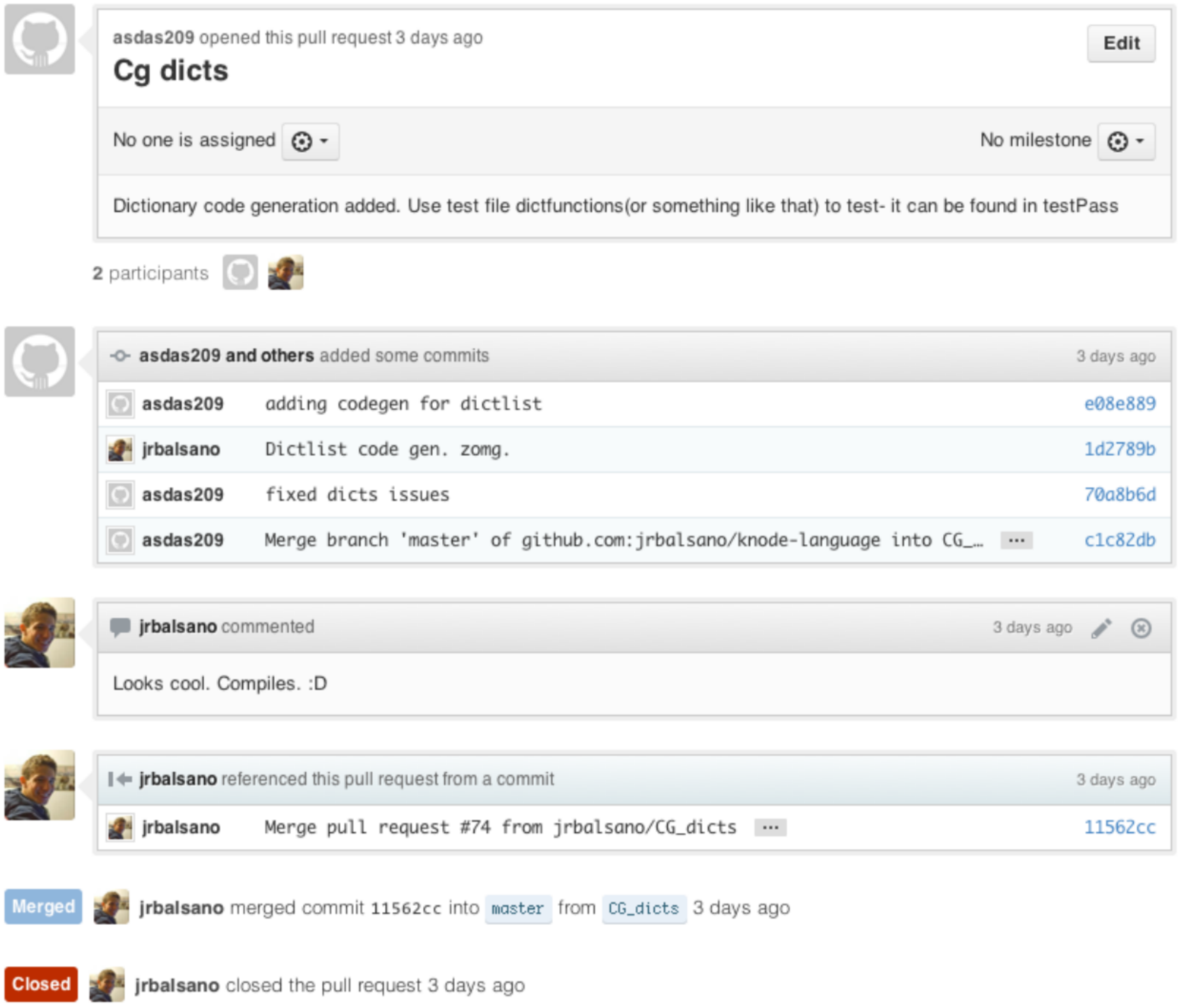
Looks cool. Compiles. :D

jrbalsano referenced this pull request from a commit — 3 days ago

jrbalsano	Merge pull request #74 from jrbalsano/CG dicts	11562cc

Merged — **jrbalsano** merged commit 11562cc into master from CG_dicts 3 days ago

Closed — **jrbalsano** closed the pull request 3 days ago



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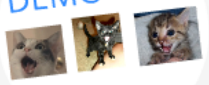

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