Genesis

And on the first day...

Samuel Cohen (slc2206) - Manager
Michael Wang (mlw2167) - Language Guru
Leon Stilwell (ls3223) - Language Guru
Jason Zhao (jsz2107) - Systems Architect
Saahil Jain (sj2675) - Tester

Introduction

Genesis is a Java-like language that allows for the easy creation of 2D games.

This language utilizes a collision operator to abstract away the logic behind collision detection so that the programmer can focus on the game mechanics.

It also include a complex data type “cluster” that serves as the fundamental building block for game design.

Data Types:

Primitive data types (Passed by value)

- int
- float
- char
- boolean

Type	**Description**
int	integer Example: 100
float	float Example: 2.3
char	character Example: ‘a’
boolean	Boolean value (true or false) example: true

Complex data types(Passed by reference)

Type	Description
pixel	X value, Y value, color Example:
color	R value, G value, B value
cluster	1. Collection of points and/or previously defined clusters which form a geometric shape and it's accompanying color. 2. Includes an anchor point to reference the shape.
array	A container that holds data, dynamically sized

Language Components:

Control Flow

- if
- elif
- else
- while
- for

Game Specific

- START - creates and displays a gameboard with provided dimensions, pixel size, and background color.

Indexing

- Indexing starts at 0
- Subarrays are indexed by brackets [] with a : separating first and second indices similar to Python. The first index is inclusive, and the second index is exclusive. For example array[1:5] includes the element at index 1 until but not including the element at index 5.

Function

- func *returnType funcName*(args) { }

Comments

- Comment Symbol: //

Logical Operators
- AND
- OR
- NOT

Comparison Operators
- Equals: ==
- Not equals: !=
- Greater than or equals: >=
- Less than or equals: <=
- Greater than: >
- Less than: <

Math Operators
- Multiply: *
- Divide: /
- Add: +
- Subtract: -
- Modulo: %

Collision-to-event Operator
- clust1 <!> clust2 returns whether clusters clust1 and clust2 are currently touching (in adjacent pixels) or overlapped

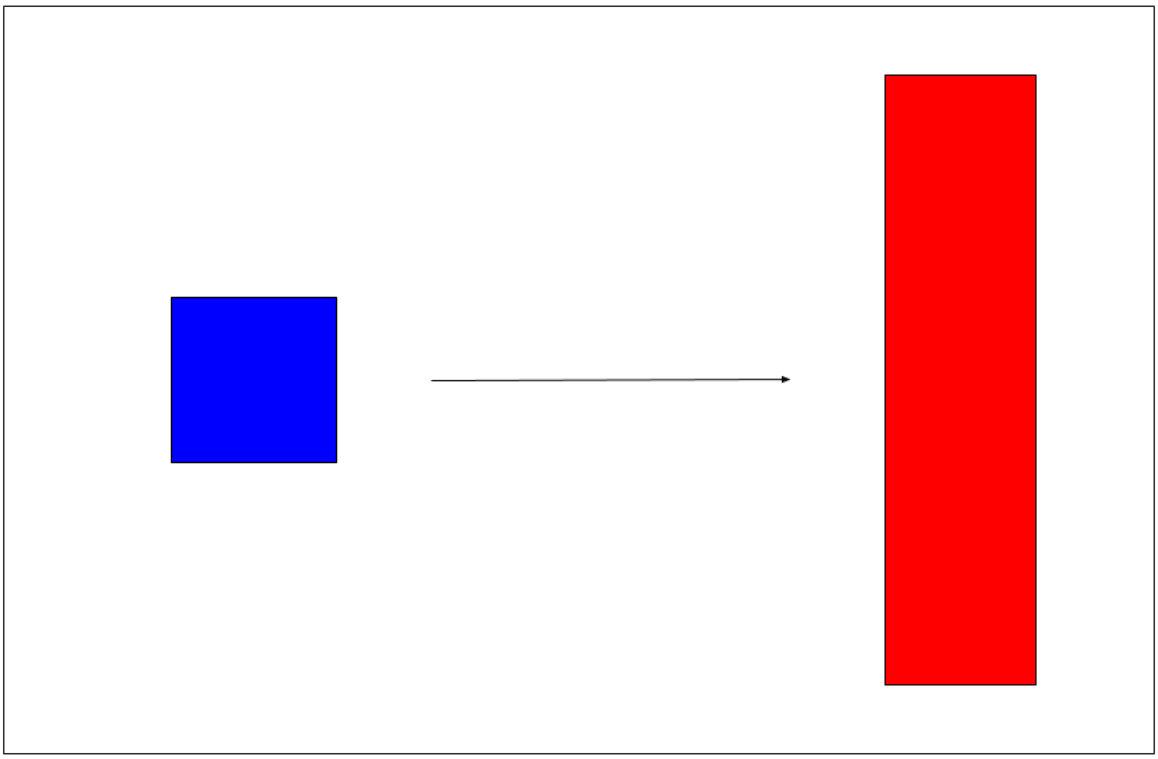
User Input
- keyPressed(KEYNAME) returns whether KEYNAME is pressed
- keyReleased(KEYNAME) returns whether KEYNAME was released since the last frame

Time & Clock Speed
- Timing is controlled by providing deltaTime, the time that has elapsed since the last frame was rendered, through the onUpdate function.
- The engine will render frames as quickly as possible (Clock speed is not defined by the programmer or the language)

Code Example

- In the background grab the screen resolution/dimensions and scale appropriately

- Initialize dimensions n * m
- Initialize square pixel size x * x
- Initialize background color <r,g,b> (Prim)
- Define timer: paired with seconds on a clock
- User inputs (keys &/or mouse)
- Define shapes/color



```
//Make new board
START 1280, 960, 1, <255, 255, 255>

//Make new object cluster
cluster lavaWall = new cluster{
      x=1080;
      y=480;
      width=100;
      height=800;
      color = <255, 0, 0>;
}

float timePressed = 0;
```

```
cluster player = new cluster{

	//These properties are of type int
	x=200;
	y=480;
	width=100;
	height=100;
	color = <0, 0, 255>;

	// Automatically gets called by engine
	onUpdate(float deltaTime) {
		if(keyPressed(“right”)) {
			timePressed += deltaTime;
			if(timePressed > .1){
				//Move if the key has been pressed for .1 sec
				this.x += 1;
				timePressed = 0;
			}
		} else {
			timePressed = 0;
		}

		//Check for collision
		if(this<!>lavaWall){
			this.delete();
		}
	}
}

//Global update function
onUpdate(float deltaTime){
	if(keyPressed(“esc”)){
		wall.delete();
		player.delete();
	}
}
```