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PIE-NUM
Matrix Based Image Processing Language
AGENDA

Overview

Let’s eat! Grandpa
Let’s eat Grandpa

Syntax

Sample

Architecture

Testing

Management

Lesson Learned

Demo
Flexible across platforms
Python/Java like syntax
C Standard Library
PPM images → manipulate image
ROLES

Hana
Project Manager

Ogo
System Architect

Hadiah
Language Guru

Catherine
Tester
MAJOR EVENTS

Project Proposal
Scanner, Parse, AST First Draft
Array and Matrices Started
Array and Matrix Pointers
Demo Completed

Language Reference Manual
Hello World
Array and Matrices Operation
Semant and Codegen Completed

9/26 10/16 11/1 11/8 11/15 11/29 12/6 12/14 12/18
SYNTAX

# Comment
# This is a comment #

Primitives
int, float, Boolean, String, Mat, Arr, Img

Control Flow
if, else, while, for, return
SYNTAX

Arithmetic
+ , - , * , / , = , ++ , --

Conditional
== , != , < , <= , > , >=

Array
Arr int[3] arr;
arr = [1,2,3];
Matrix
Mat int[2][2] mat;
mat = [[1,2],[3,4]];

Function
int function(a){
    return a;
}
int get_image_cols(String filename) {
    Img img; // img is an int* #
    int ncols;
    img = read_file(filename);
    ++img;
    ncols = &img;
    return ncols;
}

int main(){
    int val;
    val = get_image_cols("ogo.ppm");
    printi(val);
    return 0;
}
```c
int get_image_cols(String filename) {
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```
ARCHITECTURE

- Source Code
  - Scanner
  - Parser
  - AST

- Codegen
  - Semant

- Linker
  - GCC .o
    - Functions
      - C Library

- Assembly Code
  - Executable
TESTINGS

Compilation
40 pass, 30 fail

Scanner
7 cases

Parser
5 cases
MANAGEMENT

Meetings!!!

Pair Programming

Branches

Meeting with TA
GITHUB PROGRESS

1. hanafusman
   - 125 commits
   - 3,974 ++ 342 --

2. onwodoh
   - 44 commits
   - 74,809 ++ 1,768 --

3. caz2114
   - 26 commits
   - 15,261 ++ 11,049 --

4. hkvenner
   - 19 commits
   - 989 ++ 295 --
LESSONS LEARNED HANA

“Communication is key to success in a group project”

“Create goals as a team and work until the goal's are achieved”

“Learning the theory in the beginning of the semester”
LESSONS LEARNED

OGO

“You can’t just ‘hack’ your way through”

“Learning curve for functional programming is steep! Start early!”
LESSONS LEARNED

HADIAH

“Working on the semant file in a separate branch”

“Maintain weekly meeting times from early on in the semester”

“Sort through merge conflicts as soon as possible”

“Speak with TAs”
LESSONS LEARNED
CATHERINE

“Start testing early”

“Be flexible with helping your teammates”

“Find group member with similar work ethic”
DEMO!!!
CONWAY’S GAME OF LIFE

0 player game where cells are either dead or alive

Stable

Repeating
$M_T(t) = M_A(1 - t) + M_Bt$