

eGrapher



# ■ Team Members

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# BIG **CONCEPT**



eGrapher: A Programming Language for Art  
Now we are c like language

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# 1. Introduction

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Let's go over what eGrapher is all about.

# Let's **review** some concepts



**LLVM:** Backend is able to be compiled into LL IR code, which allows for cross-platform code.



**Struct:** Simplified version of an object, which can be customized to include standard types from the library.



**Standard Library:** Print, and standard methods of a List including add, get etc.



**List:** a mutable list implemented by c linked list

 **>2,000** lines of code

Efficient code

 **hundreds** errors

Shift/reduces/syntax...

 **100%**

Total success of test cases!

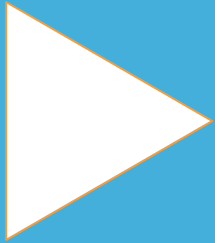
## 2. Implementation

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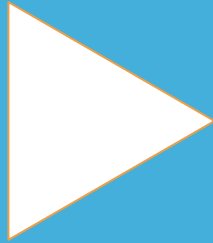


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# Implementation



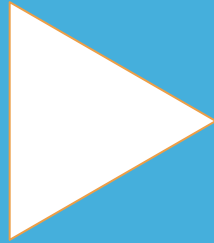
**Input**



**Tokens**



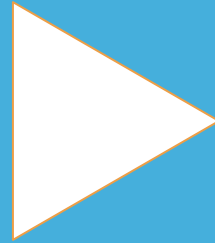
**Scanner**



**AST**



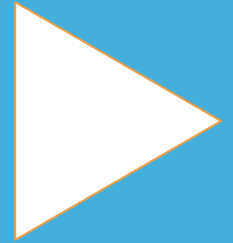
**Parser**



**SAST**



**Semantic  
Checking**



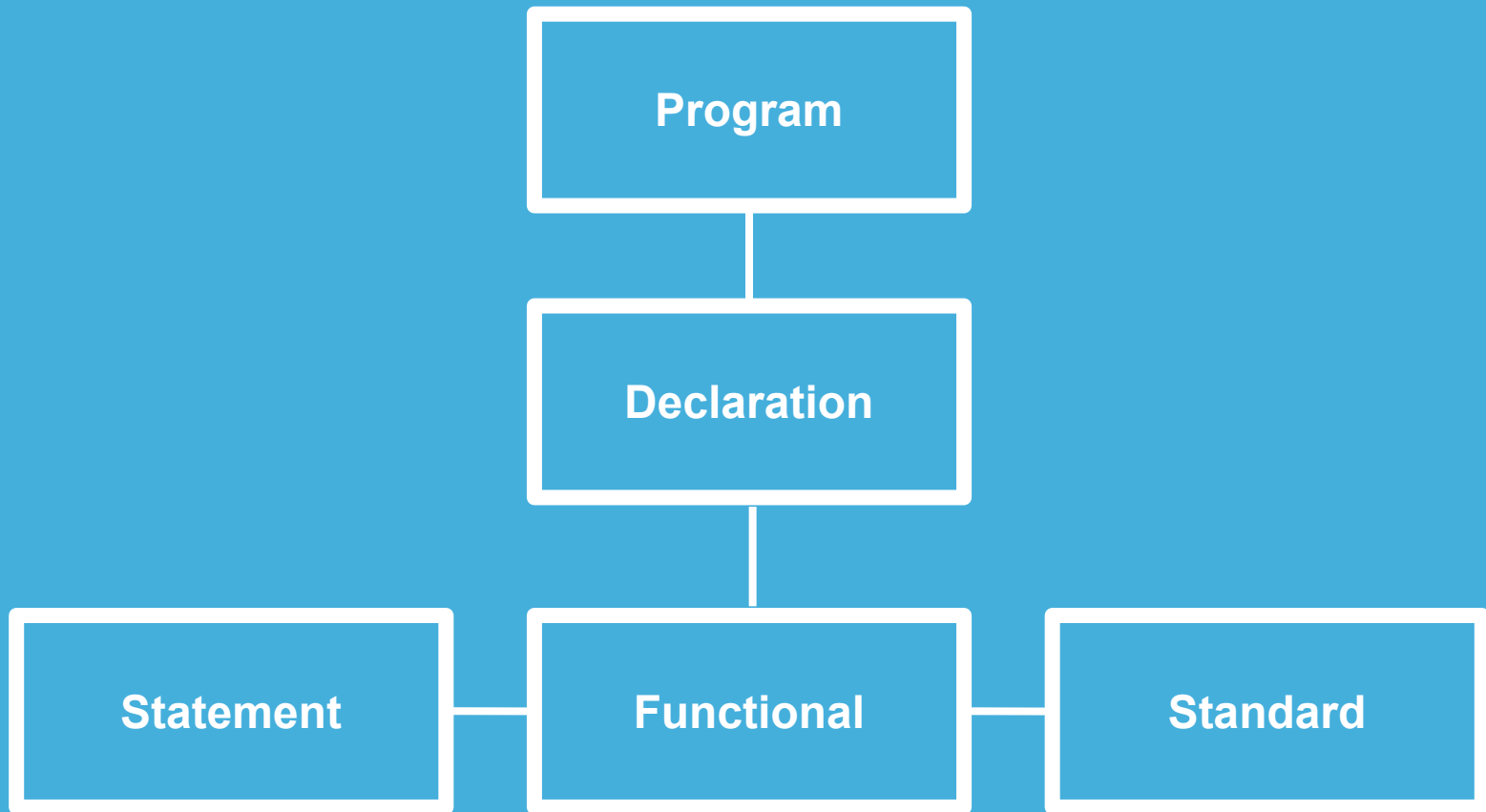
**Out.ll**



**Codegen**

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# Implementation



## 2. Syntax

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# Syntax

## Comments

`/* multiple  
lines */`

## Operators

`+, -, *, /, %  
==, !=, <, >, <=, >=  
+, =`

## List

`List int x,  
Add, Get`

## Loops

`while, for`

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# Syntax

## If-else/else-if

```
if(false){
    print(123);
}else{
    print(321);
}

Return 0;
}
```

## Struct

```
Struct person[
    String name;
    Int age;
]

Int get(struct person a){
    print(a.age);
    Return a.age;
}

Int main(){
    Struct person a;
    A.age = 100;
    print (get(a));
}
```

# 4. Challenges

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# This project was **HARD**

## Programming Knowledge Experience

We knew very little about compilers and how to program languages

## How much we didn't know...

We spent countless midnights frustrated... but we made it and are happy with how far we have come.



Design of Struct

Global Variables

Scanner

Design of Language

LLVM

Parser

Implementation of  
Design Detail

Implementation of List

# 5. Demo

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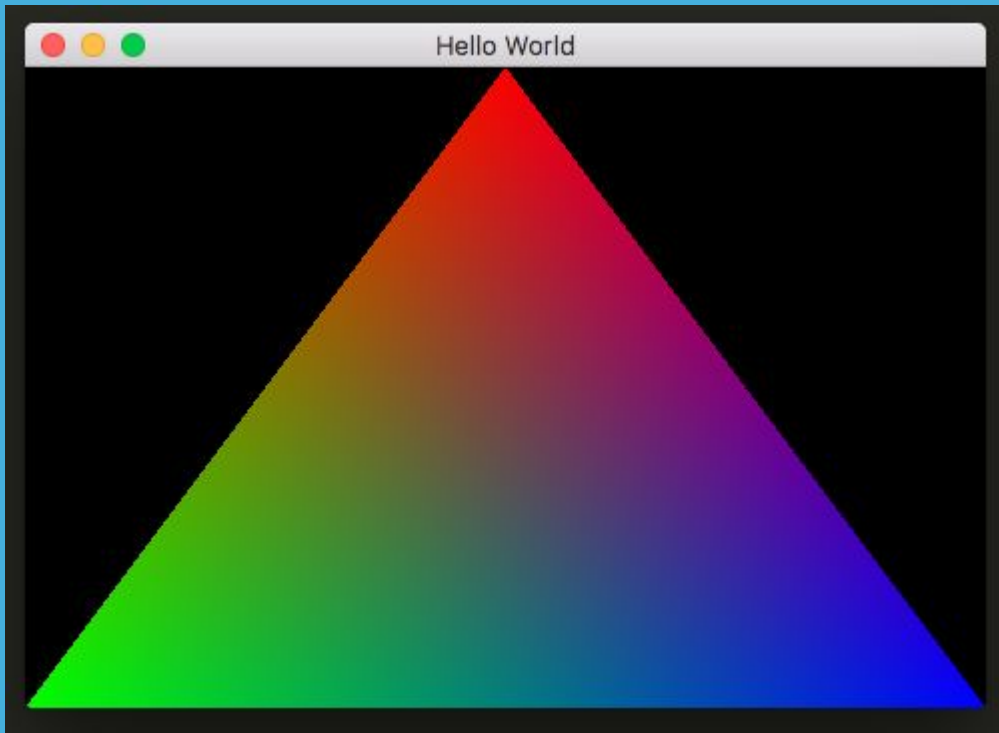
# Bubble Sort

```
/* Bubble sort code */
int main(){
    list l;
    l.add(3);
    l.add(5);
    l.add(2);
    l.add(1);
    l.add(4);
    int c, d, swap;
    int n = l.length();
    for (c = 0; c < (n - 1); c=c+1){
        for (d = 0; d < n - c - 1; d=d+1){
            if (l.get(d) > l.get(d+1)){
                swap = l.get(d);
                l[d] = l.get(d+1);
                l[d+1] = swap;
            }
        }
    }
    print("Sorted list in ascending order:\n");
    for (c = 0; c < n; c=c+1){
        print(l.get(c));
        print(" ");
    }
}
```

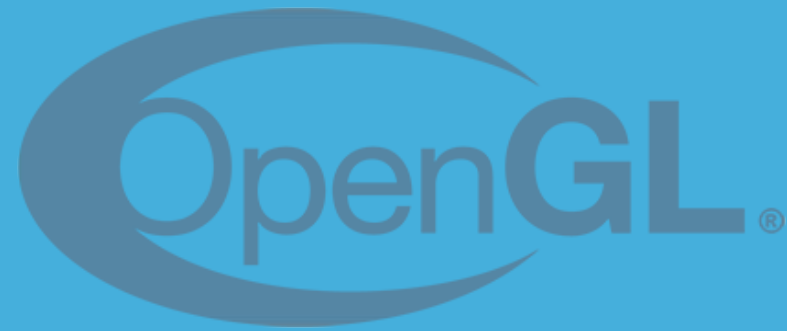
Input: 9 2 8 7 5 1 8

Output: 1 2 5 7 8 8 9

# ■ Plotting



*Link to OpenGL*



# THANKS!

Any questions?

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