Venture

Start Yours

James Sands (js4597)
Naina Sahrawat (ns3001)
Zach Adler (zpa2001)
Ben Carlin (bc2620)

Introduction

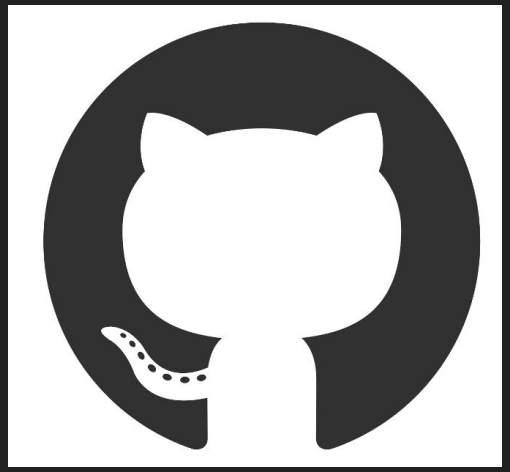
“Adventure” - history of text-based adventure games

Venture - C-like imperative language, developed in Ocaml, compiles to LLVM

Provide developer tools to spend more time imagining, and less time coding..

Language Evolution & Process

Tools we used

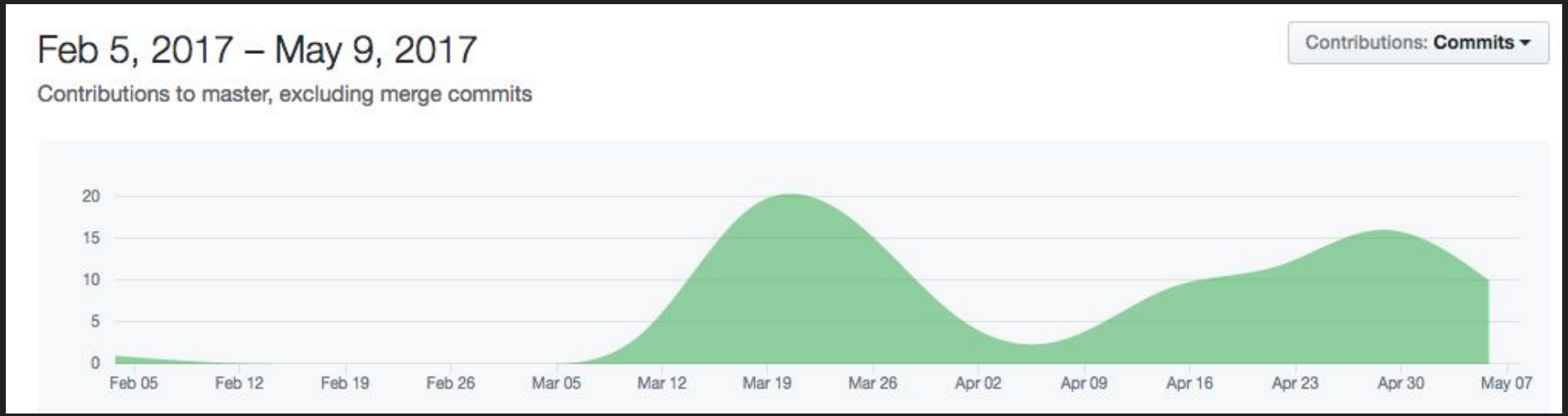


OCaml

Team Roles and Project Timeline

James - System Architect
Zach - Language Guru

Naina - Project Manager
Ben - Tester



Language Architecture & Specifications

Language Syntax

C-like syntax

```
int add(int a, int b)
{
  int c;
  c = a + b;
  return c;
}

int main()
{
  int d;
  d = add(52, 10);
  print(d);
  return 0;
}
```

```
int gcd(int a, int b) {
  while (a != b) {
    if (a > b) a = a - b;
    else b = b - a;
  }
  return a;
}

int main()
{
  print(gcd(2,14));
  print(gcd(3,15));
  print(gcd(99,121));
  return 0;
}
```

```
user_input = input();

##help##
if (help(user_input)){
        print("");
        print("Your options:");
        if (!scanner) {
                print("Talk to student");
        }
        print("Enter library");
        print("Enter [307]");
        print("Go upstairs");
        print("Go downstairs");
        print("Enter elevator");
        if (librarian && coffee) {
                print("Throw coffee in trash");
        }
        print("Inventory");
        print("");
        mathtwo(false, false);
        return 0;
}
```

Program Structure and Scoping

Programs Structure:

- -Globals
- -UDFs
- -Main

Scoping:

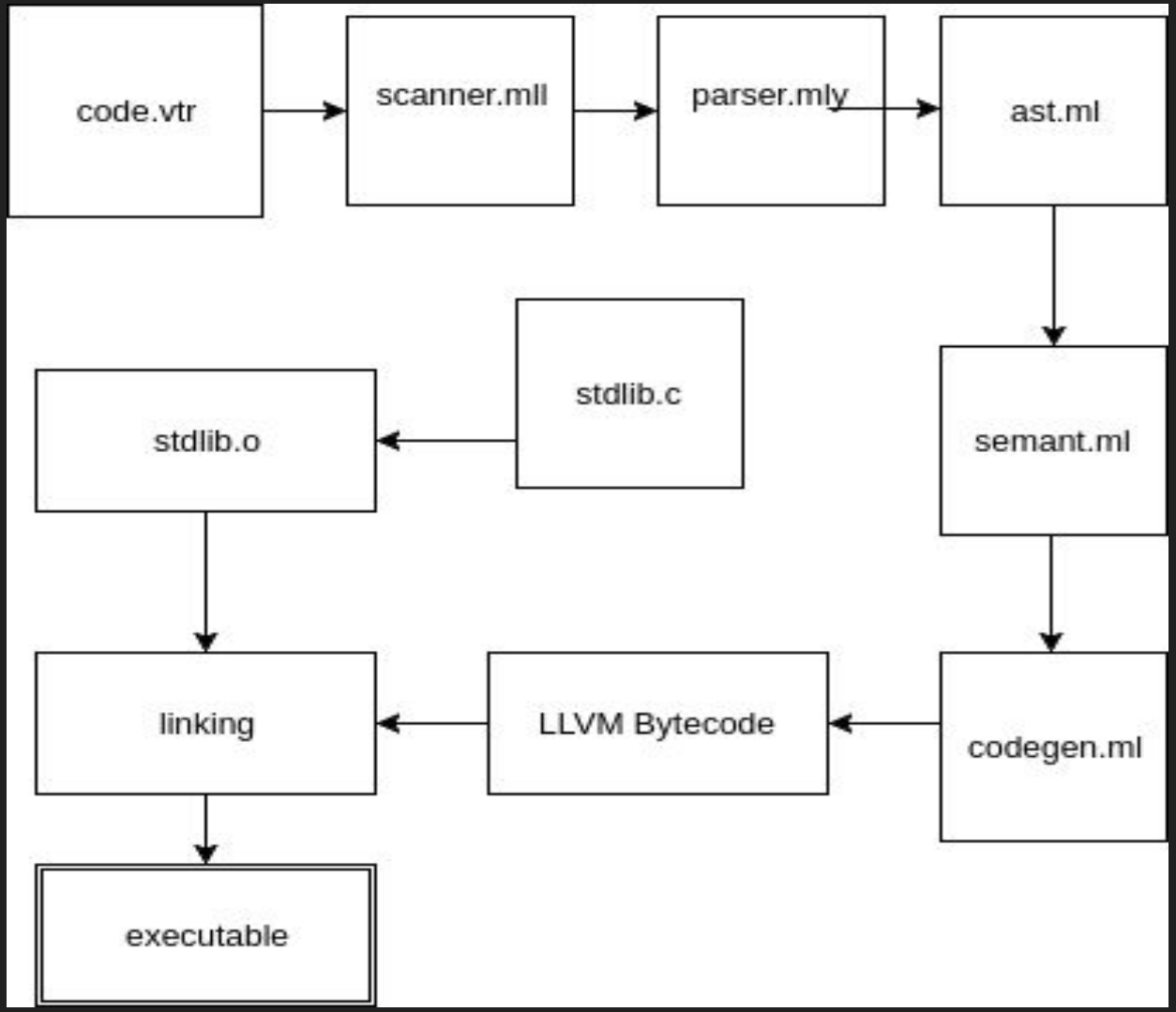
- -Static

```
int b;
int foo(){
        int a;
        a = b + 5;
        return a;
}

int bar(){
        int b;
        b = 2;
        return foo();
}
```

```
int main()
{
        b = 5;
        print(foo()); ##prints 10 ##
        print(bar()); ##prints 10##
        return 0;
}
```

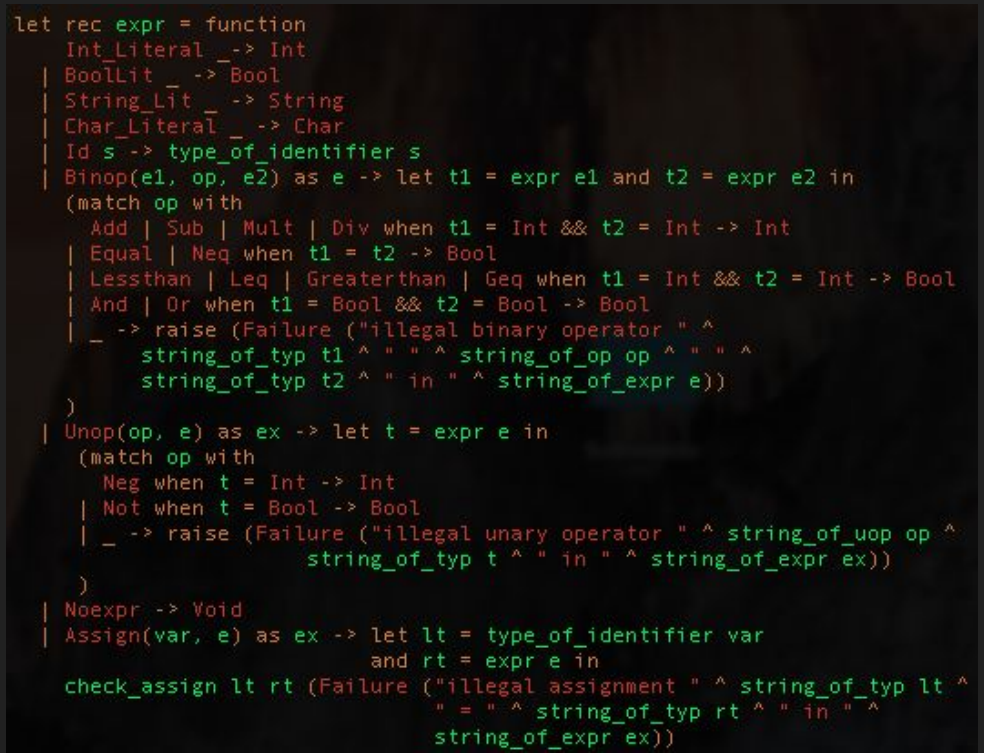
Architecture Diagram



Semantic Checker

Semantically correct AST

Symbols table



```
let rec expr = function
    Int_Literal _-> Int
  | BoolLit _ -> Bool
  | String_Lit _ -> String
  | Char_Literal _ -> Char
  | Id s -> type_of_identifier s
  | Binop(e1, op, e2) as e -> let t1 = expr e1 and t2 = expr e2 in
    (match op with
      Add | Sub | Mult | Div when t1 = Int && t2 = Int -> Int
    | Equal | Neq when t1 = t2 -> Bool
    | Lessthan | Leq | Greaterthan | Geq when t1 = Int && t2 = Int -> Bool
    | And | Or when t1 = Bool && t2 = Bool -> Bool
    | _ -> raise (Failure ("illegal binary operator " ^
          string_of_typ t1 ^ " " ^ string_of_op op ^ " " ^
          string_of_typ t2 ^ " in " ^ string_of_expr e))
    )
  | Unop(op, e) as ex -> let t = expr e in
     (match op with
       Neg when t = Int -> Int
     | Not when t = Bool -> Bool
     | _ -> raise (Failure ("illegal unary operator " ^ string_of_uop op ^
                    string_of_typ t ^ " in " ^ string_of_expr ex))
     )
  | Noexpr -> Void
  | Assign(var, e) as ex -> let lt = type_of_identifier var
                            and rt = expr e in
    check_assign lt rt (Failure ("illegal assignment " ^ string_of_typ lt ^
                                 " = " ^ string_of_typ rt ^ " in " ^
                                 string_of_expr ex))
```

Testing

Success Case

Fail Cases

Automation

4115: THE GAME!

(our demo)

Prepare your brain for the most riveting ‘venture of all. This course….