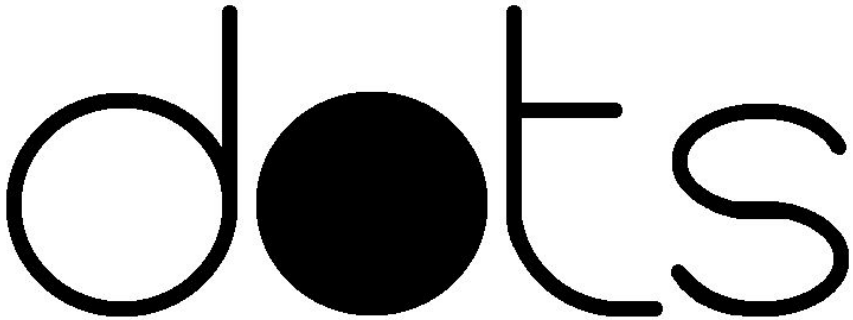


A graph programming language

The Team

Hosanna Fuller: Manager

Rachel Gordon: Language Guru

Adam Incera: C Guru

Yumeng Liao: Tester

The Problem

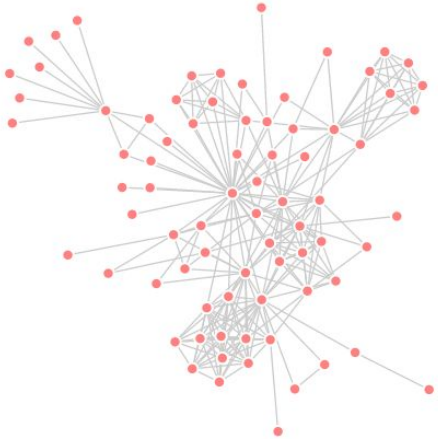
Masters student at Columbia interested in Networks

Noticed that implementing graphs or graph operations are a high cost data structure to build

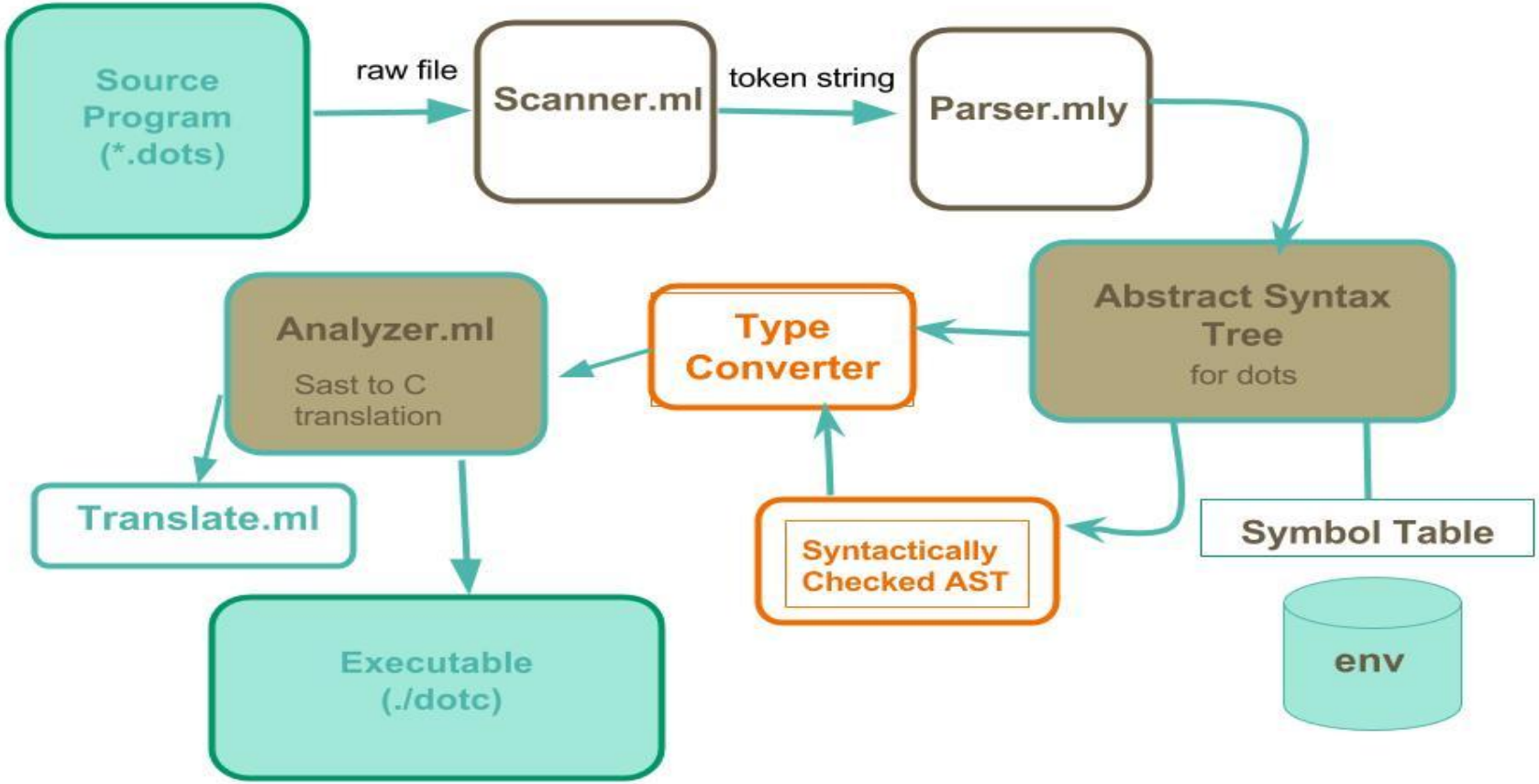
Wanted to to try to implement Graph language to help with my research

Our Goal

Create a versatile language to allow simple manipulation of graphs and their data.



Compiler Architecture



Language Features

```
/*Types*/
num
string
bool
node
graph
list<type>
dict<key,val>

/*Declare Function*/
def num foo(num bar){
    return bar;
}
```

```
/*Operators*/
 +  - * / > <
>= <= == !=
|| &&
-->[weight]

/*Some Builtin Fns*/
enqueue(x)
dequeue()
node_var.ine()
node_var.oute()
min(x)
max(x)
```

```
/*Control Flow*/
for (x in y) {
    something;
}

if (x == y) {
    something;
} else {
    other;
}

while (x == y) {
}
```

Language Basics - Hello World

```
/* This is a comment! Let’s declare and assign some variables. */
num w; string v = “hello world”;
node y; node z(“hello”);
list<num> l = [1,2,3];
dict<num,string> d; d[3.3] = “foo”; d[10] = “bar”;

/* Declare graphs with weighted edges easily */
graph g1 = {
    y -->[10] z
};

/* Alternatively, add nodes together to make a graph! */
graph g2 = y + z;
```

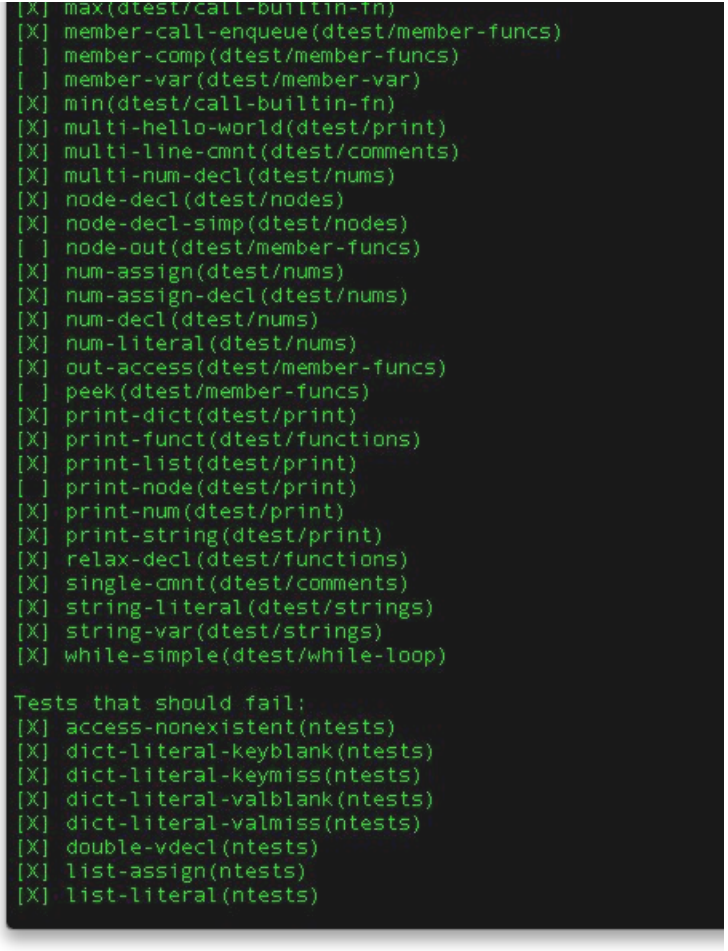
Demo

Test Suite

-Unit/Regression testing

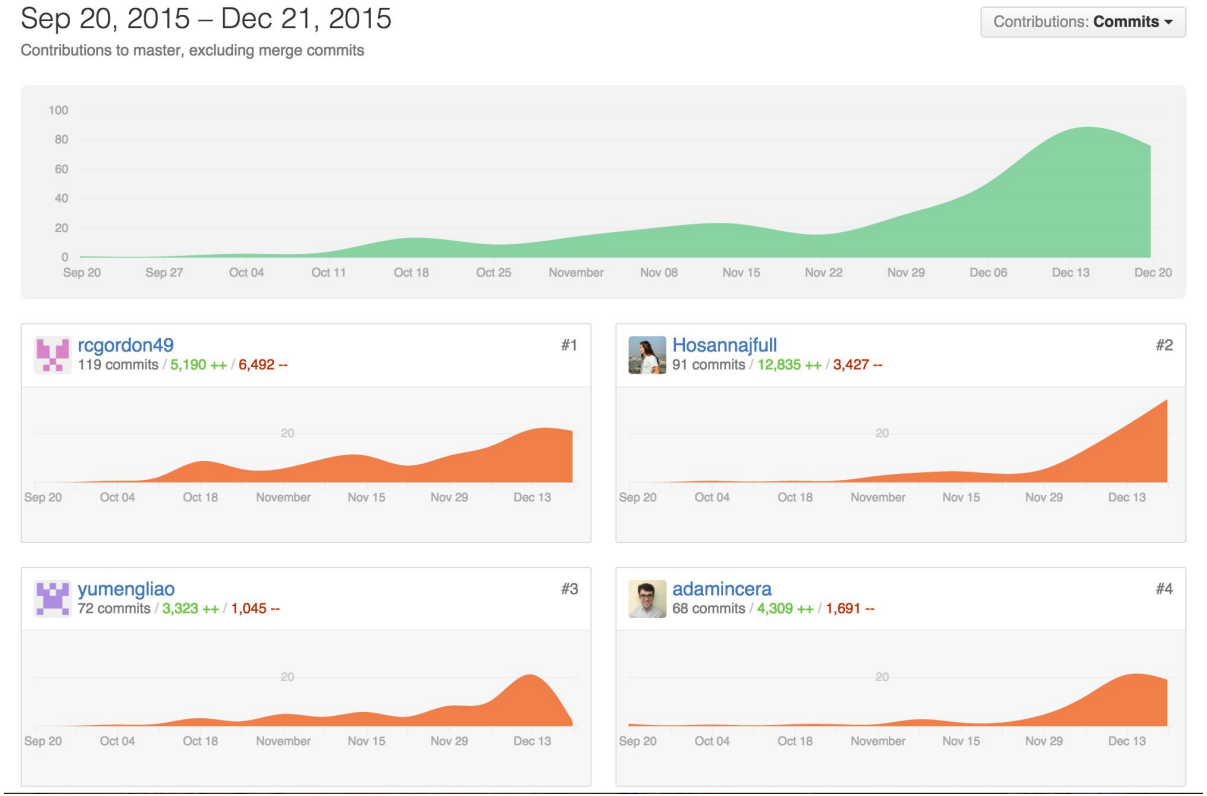
-Vast majority of testing on generated code

-Python script that runs all tests in a folder by opening subprocesses



Workflow

1. Weekly Meetings
2. Biweekly Standups
3. Slack Channel
4. Github
5. Pair Programming



Lessons Learned

-Ambition is good, but don’t try to do everything ever in the universe

-Pair programming is awesome

-Get the minimum viable product working

-Ocaml has its magical moments

Excluding merges, **4 authors** have pushed **169 commits** to master and **171 commits** to all branches. On master, **287 files** have changed and there have been **4,710 additions** and **1,119 deletions**.