WWW.BUOYDONTFLOAT.COM/PROGRAMMING-LANGUAGES

Instructions to:
1. Get the github repo
2. Open the `hackmd`
3. Link to repl.it

Intro to Programming Languages 101

For Future Presidents

Working Title

Why can't I use JavaScript everywhere?

Why am I here? Why study other programming languages when I'm not even good at one?

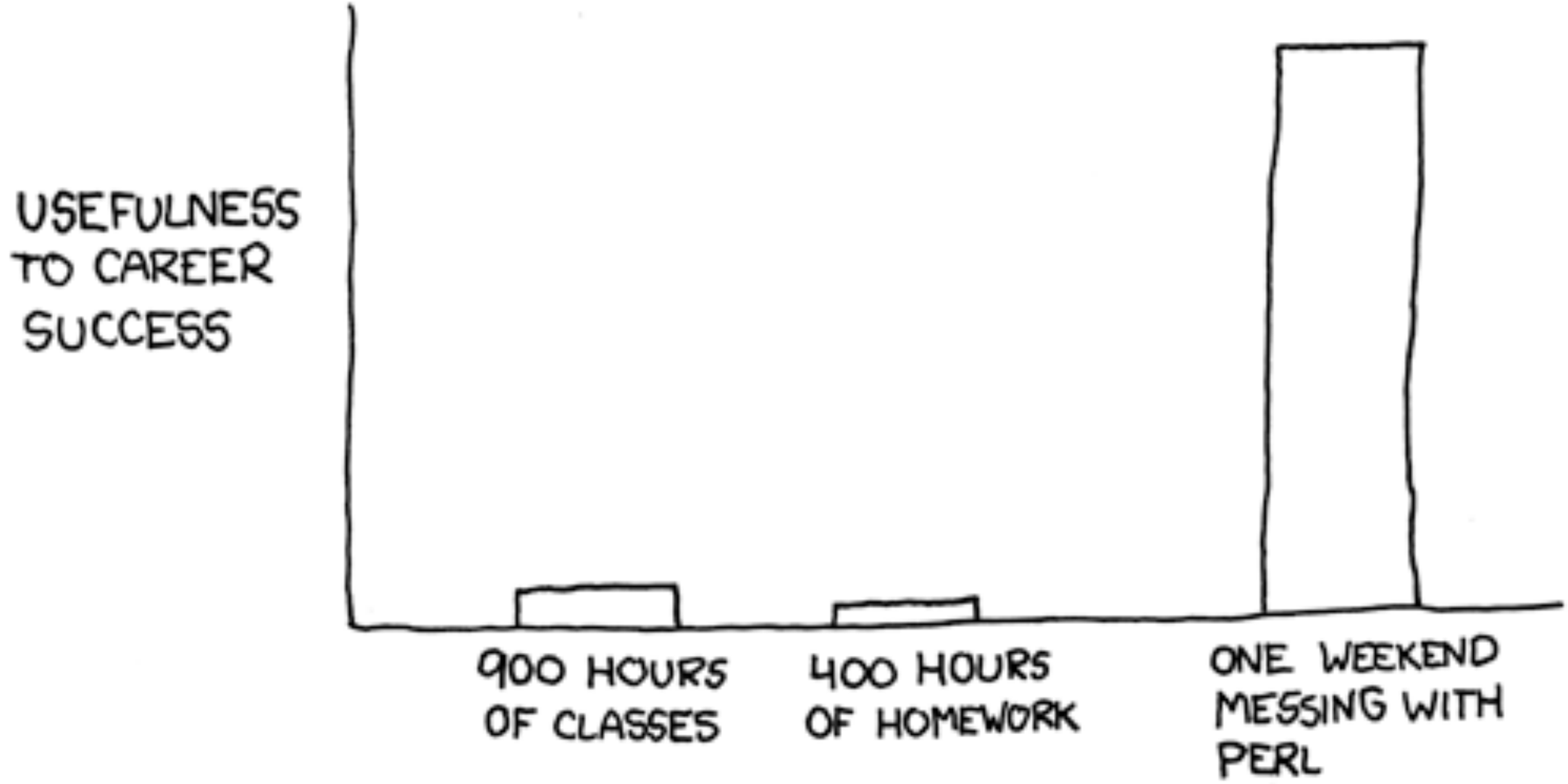
About me

level 31 human
software engineer @ dia&co
full-stack web developer <3 ruby & rails
~10 points in programming skills
emerging artist

About you

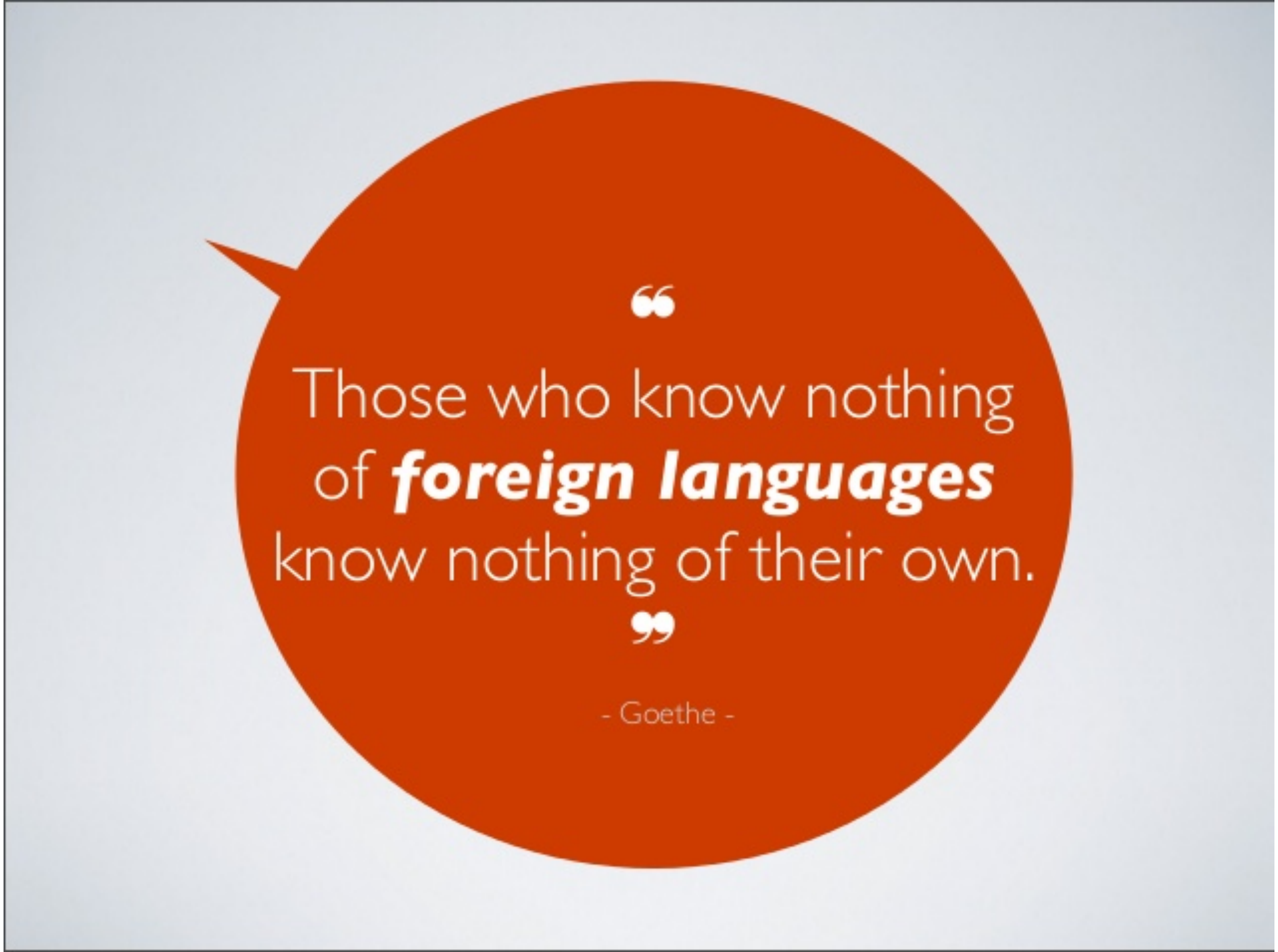
Why am I here? Why study other programming languages when I'm not even good at one?

11TH-GRADE ACTIVITIES:



“Learning another language is not only learning different words for the same things, but learning another way to think about things.” –Flora Lewis

I didn't really get a lot of English concepts until I started learning spanish:
conjugations, past participles, tenses, grammar & sentence structure, idioms


“
Those who know nothing
of foreign languages
know nothing of their own.
”
- Goethe -

Code surrounds us
It's an increasingly useful skillset
Anthony's a cool guy I wonder what he has to say

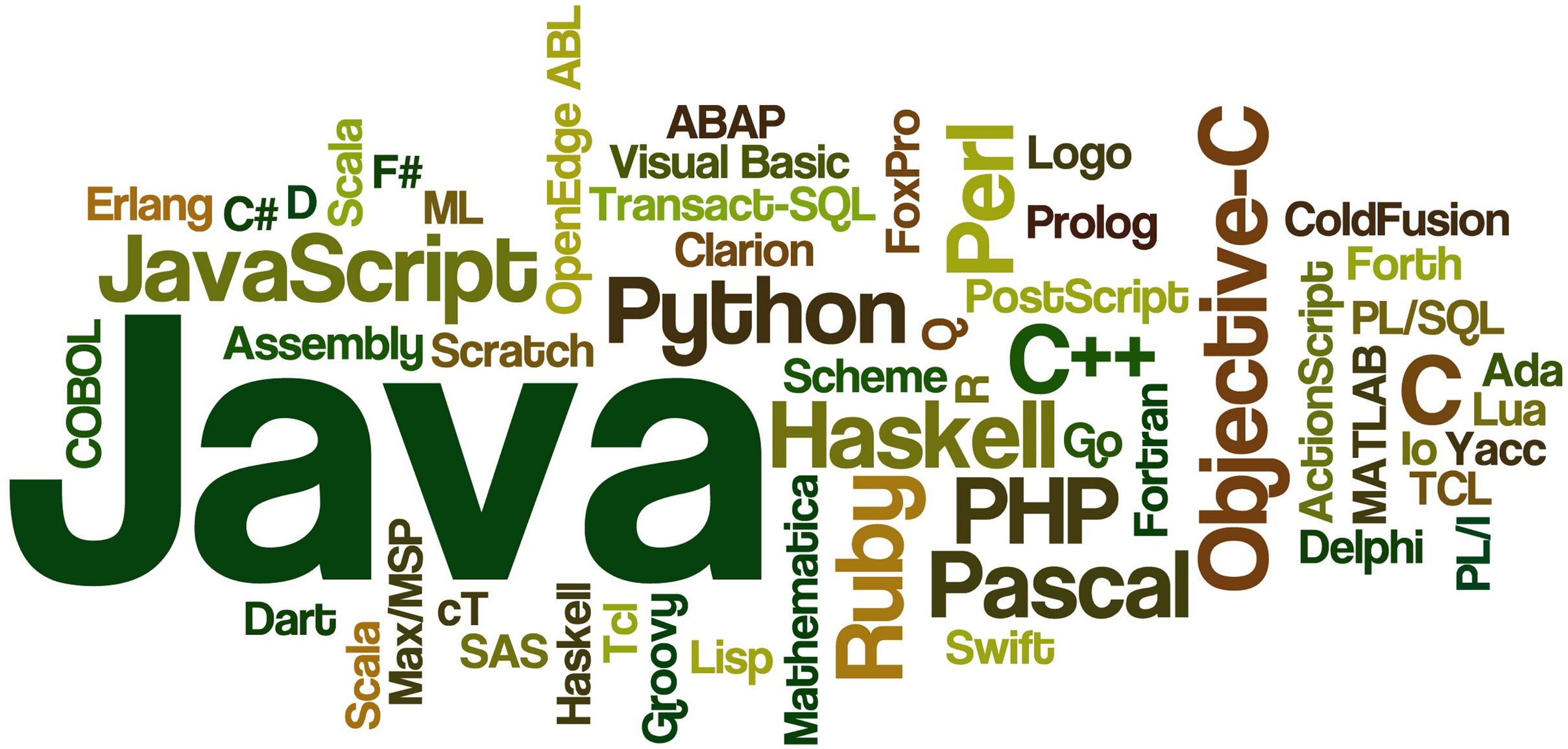
What is programming?

Coming up with a set of instructions to tell a dumb machine to do something

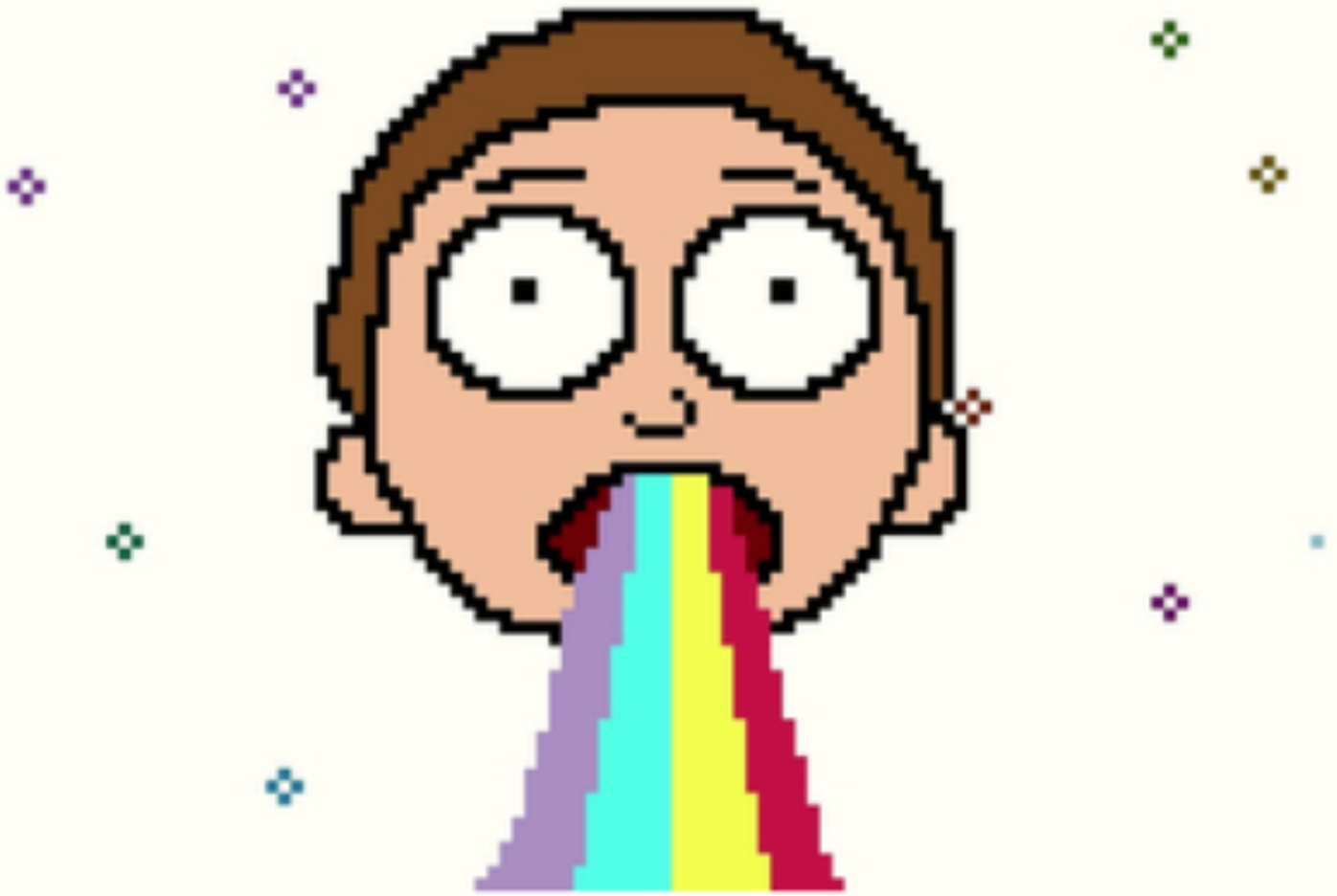
What is a programming language?

A set of rules that provide a way of telling a dumb machine what operations to perform.

Essentially, a linguistic framework for describing these operations.


Java
JavaScript
Python
C++
C
Haskell
Ruby
PHP
Pascal
Objective-C
Perl
Assembly
Scratch
Scheme
R
Q
Go
Fortran
COBOL
Dart
Max/MSP
cT
SAS
Haskell
Tcl
Groovy
Lisp
Mathematica
Swift
Scala
Erlang
C#
D
Scala
F#
ML
OpenEdge ABL
ABAP
Visual Basic
Transact-SQL
Clarion
FoxPro
Logo
Prolog
PostScript
ColdFusion
Forth
PL/SQL
ActionScript
MATLAB
Ada
Lua
Io
Yacc
TCL
Delphi
PL/I

Why the fuck do we need so many programming languages?



1. History*
2. Syntax
3. Semantics
4. Idioms
5. Libraries
6. Tools
7. Community

History

Languages are made by people

Essentially, some Jane decides she wants to create a new language to better suit a problem she is solving or to better express code how she wants.

JAVASCRIPT

JavaScript, originally called Mocha and not to be confused with Java, was created in 10 days in May 1995 by Brendan Eich for Netscape.

Created for the Netscape browser as a more approachable scripting language to make the web more dynamic.

"Java is to JavaScript what Car is to Carpet"

— some guy on StackOverflow

RUBY

RUBY

Yukihiro Matsumoto or "Matz"

A programming language focused on developer happiness!

Q: Did you have a guiding philosophy when designing Ruby?

Yes, it's called the "principle of least surprise."

I believe people want to express themselves when they program. They don't want to fight with the language.

I tried to make people enjoy programming and concentrate on the fun and creative part of programming when they use Ruby.

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Syntax

the simplest part of a programming language...

how to actually use it, e.g.
symbols
keywords
reserved words
operators
expressions
delimiters

human@buoydontfloat.com

SYNTAX DEMO

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Semantics

Syntax is the concept that concerns itself only whether or not the sentence is valid for the grammar of the language.
Semantics is about whether or not the sentence has a valid meaning.

Think of it as the evaluation rules of the language.

Crash can mean auto accident, a drop in the Stock Market, to attend a party without being invited, ocean waves hitting the shore or the sound of a cymbals being struck together.

SEMANTICS DEMO

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Idioms

Every Dog Has His Day
Tomar El Pelo
Head in the Clouds

This is where you get expert-level at a language!

IDIOMS DEMO

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Libraries

existing code you can use

because it would take too long to build some of these:

math, crypto, file input/output, etc.

Libraries

standard library

libraries baked into the programming language

third-party libraries

libraries available to you via the community, e.g. open-source

Libraries

package managers

`npm`, `gem`, `pip`, `brew`, `yum`, `luarocks`

JAVASCRIPT

```
npm install superb
```

RUBY

```
gem install awesome_print
```

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TOOLS

WHAT'S AVAILABLE TO WORK WITH THE PROGRAMMING LANGUAGE?

TOOLS: EDITORS

INTEGRATED DEVELOPMENT ENVIRONMENT (IDE)

arduino IDE
eclipse / jetbeans / xcode / rubymine

TEXT EDITORS

atom / sublime / vim / etc.

TOOLS: WITH A PURPOSE

processing
p5
python notebook

TOOLS: FRAMEWORKS

rails
express
wordpress
react / angular / ember

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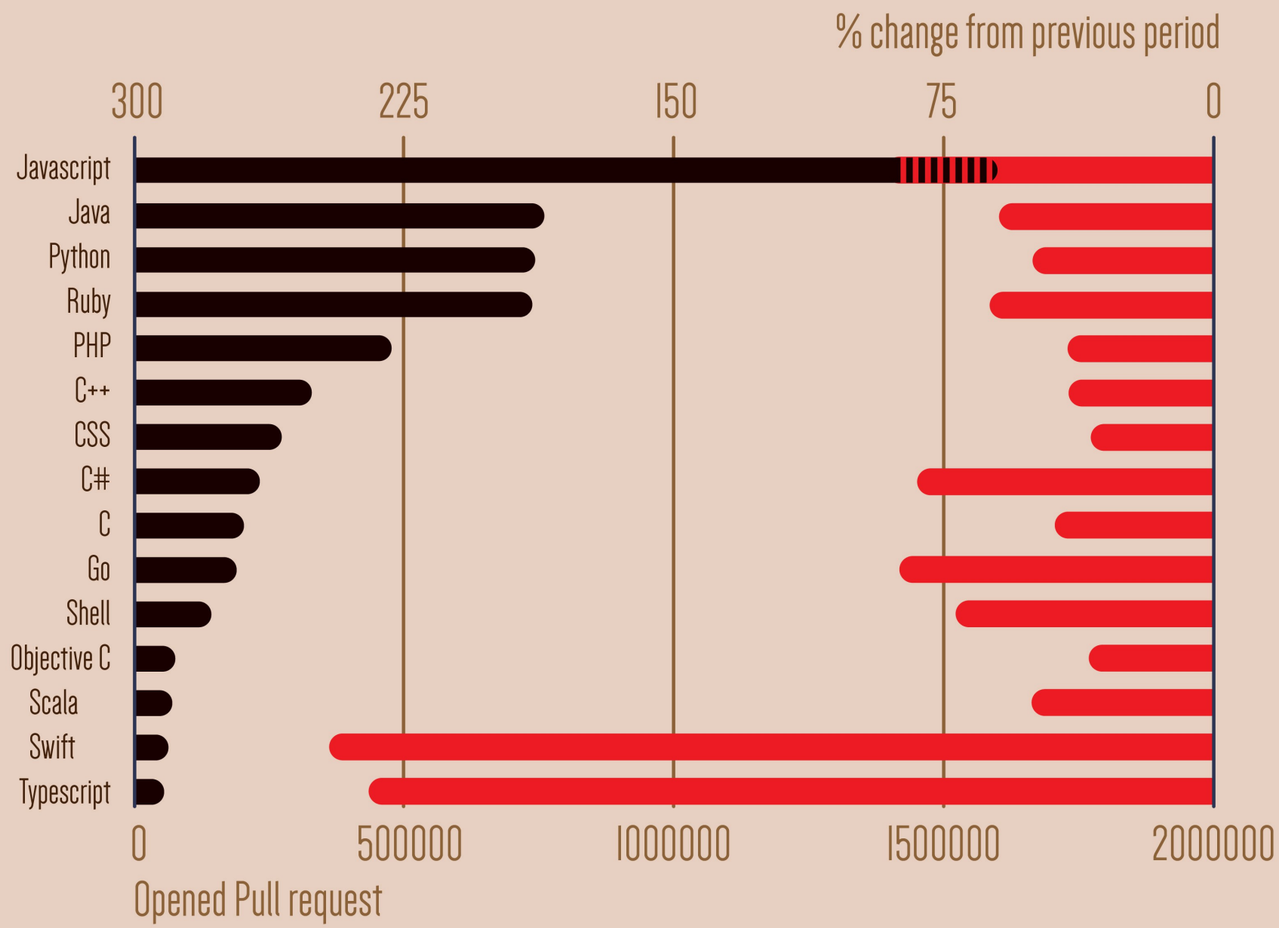
Community

What problems are people solving?

stability
open-source
support
conferences
influencers

hackerearth

GITHUB MOST POPULAR LANGAUGES



What problems are people using that programming language focused on solving?

RUBY

developer happiness
web development
server-side scripting

examples

rails / sinatra

PYTHON

deeply entrenched in academia
lots of sophisticated math libraries and tools

examples

python notebook
numpy / scipy
tensorflow

JAVASCRIPT

everyone
everything

examples

nodejs
asynchronous
reactjs / vuejs / angularjs / emberjs

C / C++

fast fast fast
stable

examples

openframeworks
openCV / computer vision
native code, e.g. iOS apps, application binaries

How nice is the community? Approachability?

RUBY

MINSWAN (Matz is nice, so we are nice)

C / C++

RTFM

AMA

Hard Topics =[

- Interpreted vs Compiled
- Object Oriented Programming
- Prototypical inheritance
- Functional vs Imperative
- static language vs dynamic language
- strong and weak typing

Factorial

Write a function that takes a number n and returns the factorial (sum of numbers 1 to n), e.g.

```
factorial(1) => 1
factorial(3) => 6
factorial(7) => 5,040
```

FizzBuzz

Write a program that prints the numbers from 1 to 100. But for multiples of three print “Fizz” instead of the number and for the multiples of five print “Buzz”. For numbers which are multiples of both three and five print “FizzBuzz”.

Prime Numbers

Write a program that prints the first 100 prime numbers.

Proof of Work

Write a program that takes a transaction string and appends numbers to the end to find the first SHA256 hash that starts with "000".

```
transactions = "100,anthony,alice;500,alice,bob;20,alice,anthony"
```