

Basic Computer Programming



Introduction

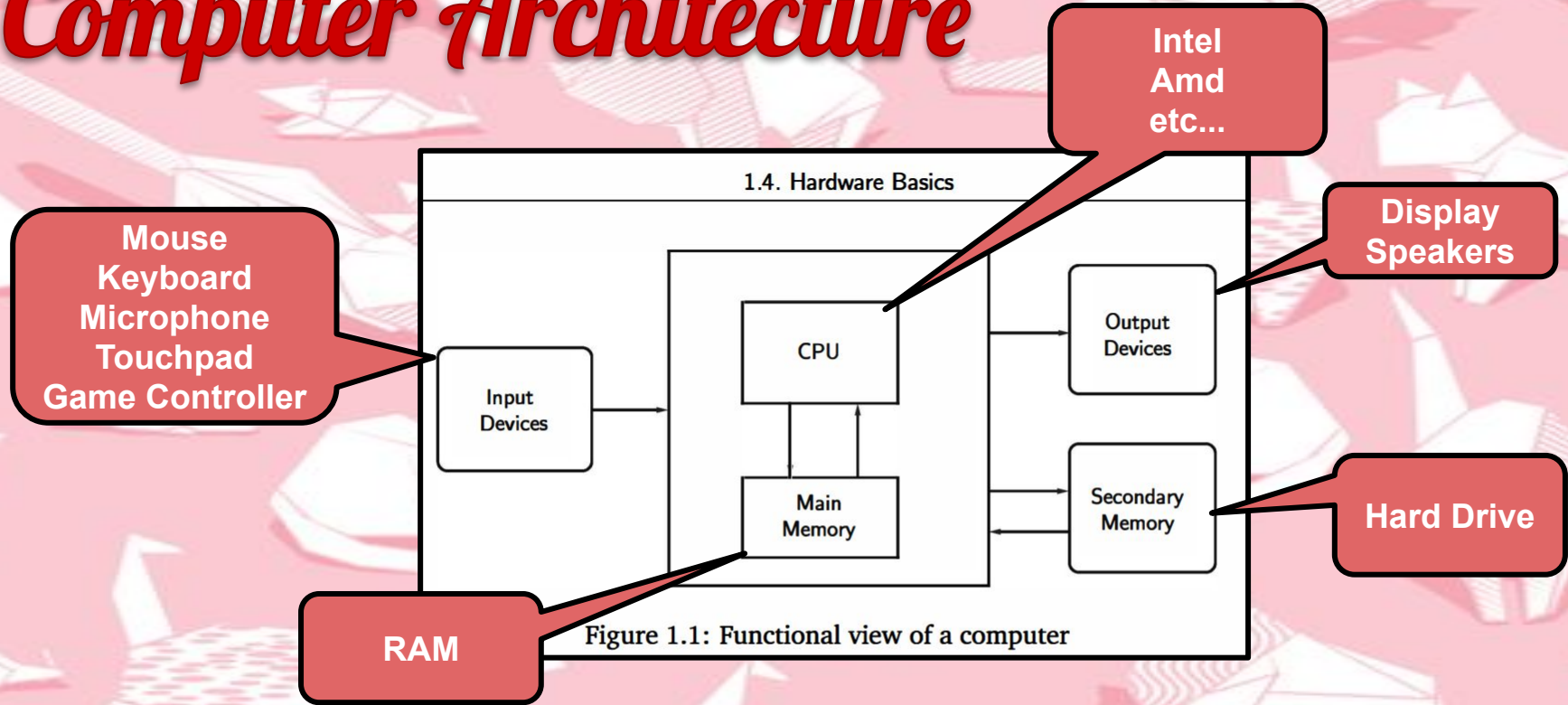
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Shit To Go Over

- I. Basic Computer Architecture
- II. Programming Languages
- III. Interpreted vs Compiled
- IV. Development Environments
- V. Data Types
- VI. Variables
- VII. Syntax
- VIII. Functions
- IX. Library & Frameworks



Computer Architecture



Programming Languages

Source Code

```
1 print("Hello, Taylor")
2 print("Don't be afraid, this isn't too hard...yet")
3
4 myVariable = 42
5
6 print("The answer to everything is: ", myVariable)
```

Readable by humans

Binary

```
9
10
11 0010 0011 1110 1100
12 0010 1000 1111 0110
13 0011 1010 1011 0001
14 0101 0100
```

Readable by machines

Assembly

```
19      inc ecx
20      mov eax, ecx
21
22      mov esp, ebp
23      pop ebp
24      ret                ; RET now
```

Specific to CPU Type

Hexadecimal

```
1 |8950 4e47 0d0a 1a0a 0000 000d 4948 4452
2 |0000 07e5 0000 0594 0806 0000 0017 b4
3 |5600 0000 0970 4859 7300 002e 2300 00
4 |2301 78a5 3f76 0000 0139 6943 4350 506
5 |6f74 6f73 686f 7020 4943 4320 7072
6 |c0c0 c0c0 c0c0 c0c0 c0c0 c0c0 c0c0
```

A sort of binary shorthand

Interpreted vs Compiled

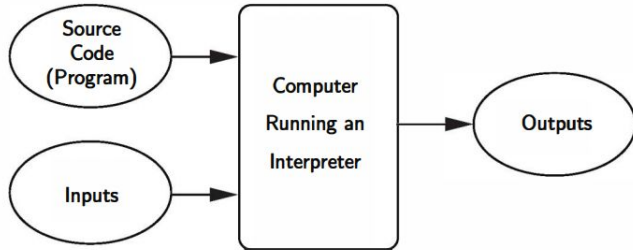


Figure 1.3: Interpreting a high-level language

Examples:
Python
Lisp

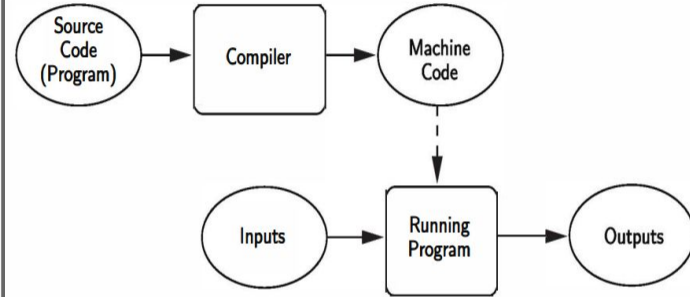


Figure 1.2: Compiling a high-level language

Examples:
C++
C

Interpreted vs Compiled

- ❖ Typically runs slower
- ❖ Good for developing prototypes
- ❖ Often has more english-like syntax
- ❖ Can be written from a file
- ❖ Can be run line by line in the command line

Interpreted

- ❖ Typically runs faster
- ❖ Less portable between computers
- ❖ Needs to be recompiled whenever transferred to different machine
- ❖ More verbose syntax
- ❖ Must be Saved -> Compiled -> Run

Compiled

Development Enviroments



Sublime Text Editor



Spyder Interactive Development Environment

```
C:\Users\bdabd\AnacondaProjects\SortingAlgorithms.py - Sublime Text (UNREGISTERED)
File Edit Selection Find View Goto Tools Project Preferences Help
Moby-to-net.py x intro.py x untitled x Asinine.py x Percepton.py x Question 4 Implementation.py x
1 # -*- coding: utf-8 -*-
2 """
3 Created on Sat Mar 9 05:04:55 2019
4
5 @author: Luna Celestine
6 """
7
8 A = [64, 25, 12, 22, 11]
9
10 def selection_sort(arr):
11
12     for i in range(len(arr)):
13
14         minimum_index = i
15         for j in range(i+1, len(arr)):
16             if arr[minimum_index] > arr[j]:
17                 minimum_index = j
18
19         arr[i], arr[minimum_index] = arr[minimum_index], arr[i]
20     return arr
21
22
23 print ("Sorted array")
24 B = selection_sort(A)
25
26 for i in range(len(B)):
27     print("%d" %B[i]),
28
29
30
```

Variable explorer

Name	Type	Size	Value
A	list	5	[11, 12, 22, 25, 64]
B	list	5	[11, 12, 22, 25, 64]
C	list	5	[11, 12, 22, 25, 64]
i	int	1	4

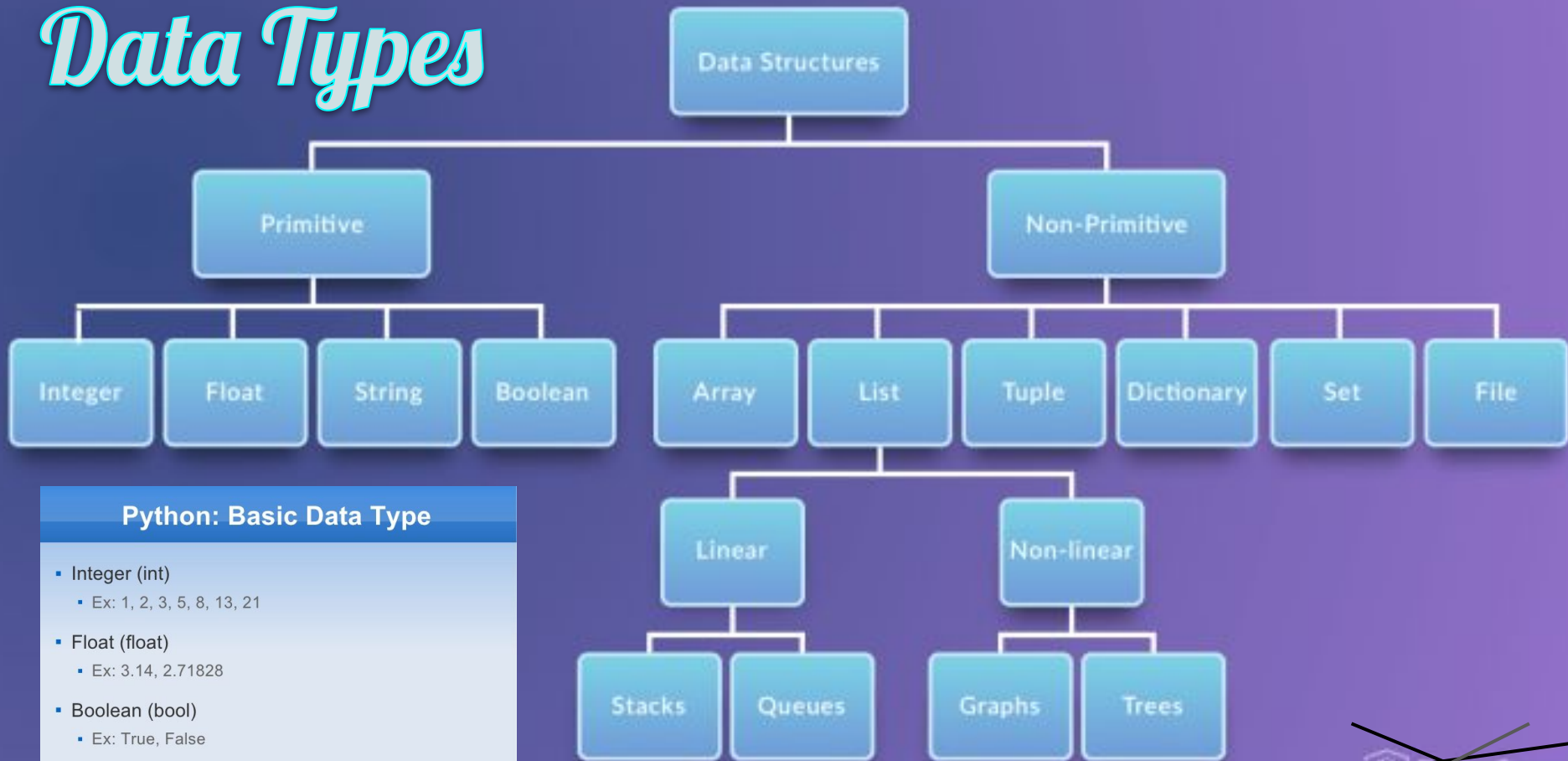
Python console

```
Python 3.7.1 (default, Dec 10 2018, 22:54:23) [MSC v.1915 64 bit (AMD64)]
Type "copyright", "credits" or "license()" for more information.

Python 7.2.0 -- An enhanced Interactive Python.

In [1]: runfile('C:/Users/bdabd/AnacondaProjects/SortingAlgorithms.py', wdir='C:/Users/bdabd/AnacondaProjects')
Sorted array
11
12
22
25
64
Insertion Sort
11
12
22
25
64
In [2]:
```


Data Types



Python: Basic Data Type

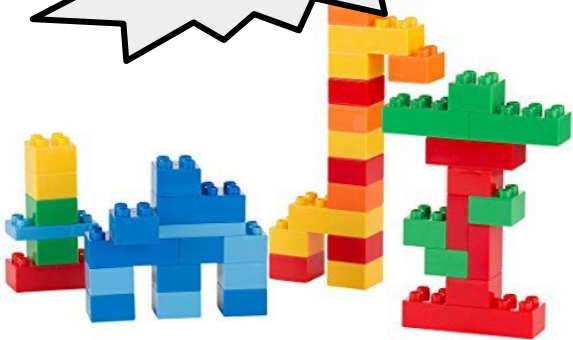
- Integer (int)
 - Ex: 1, 2, 3, 5, 8, 13, 21
- Float (float)
 - Ex: 3.14, 2.71828
- Boolean (bool)
 - Ex: True, False
- String (str)
 - Ex: 'Python', "Sucha"

Data Types

Primitive
Types



Data
Structures



lolwut?



Variables

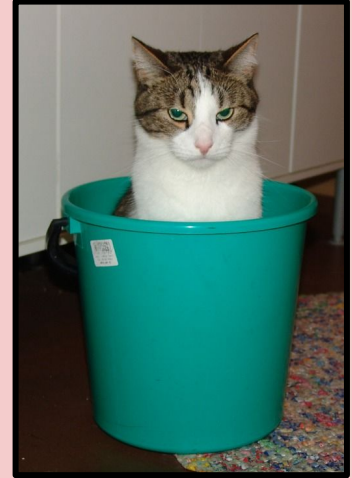
Variable



Value



**Value Assigned to
Variable**



Variables

Values Assigned to Variables in Data Structures



! CAUTION



TypeError: expected liquid, got cat

Syntax

Much like grammar, syntax is important

01110111
01110100
01100110?

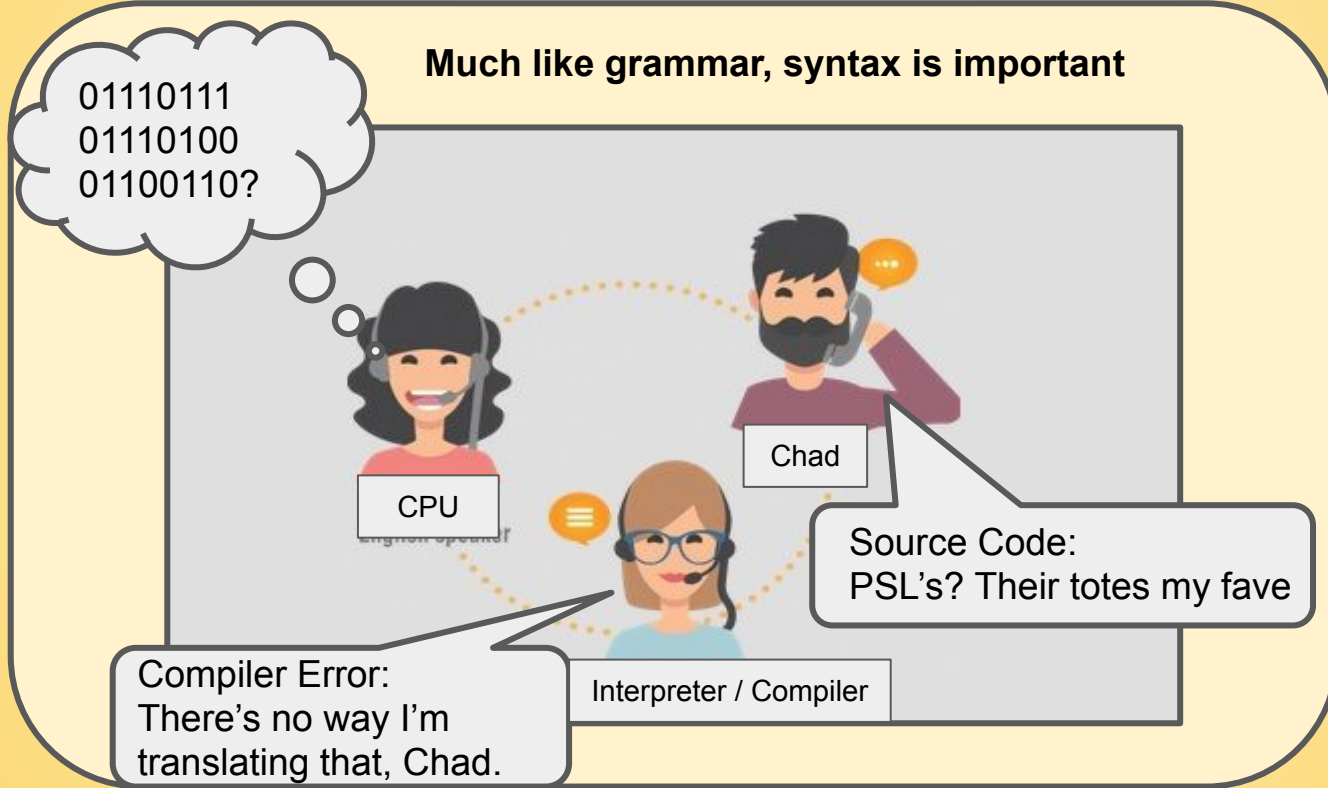
CPU

Chad

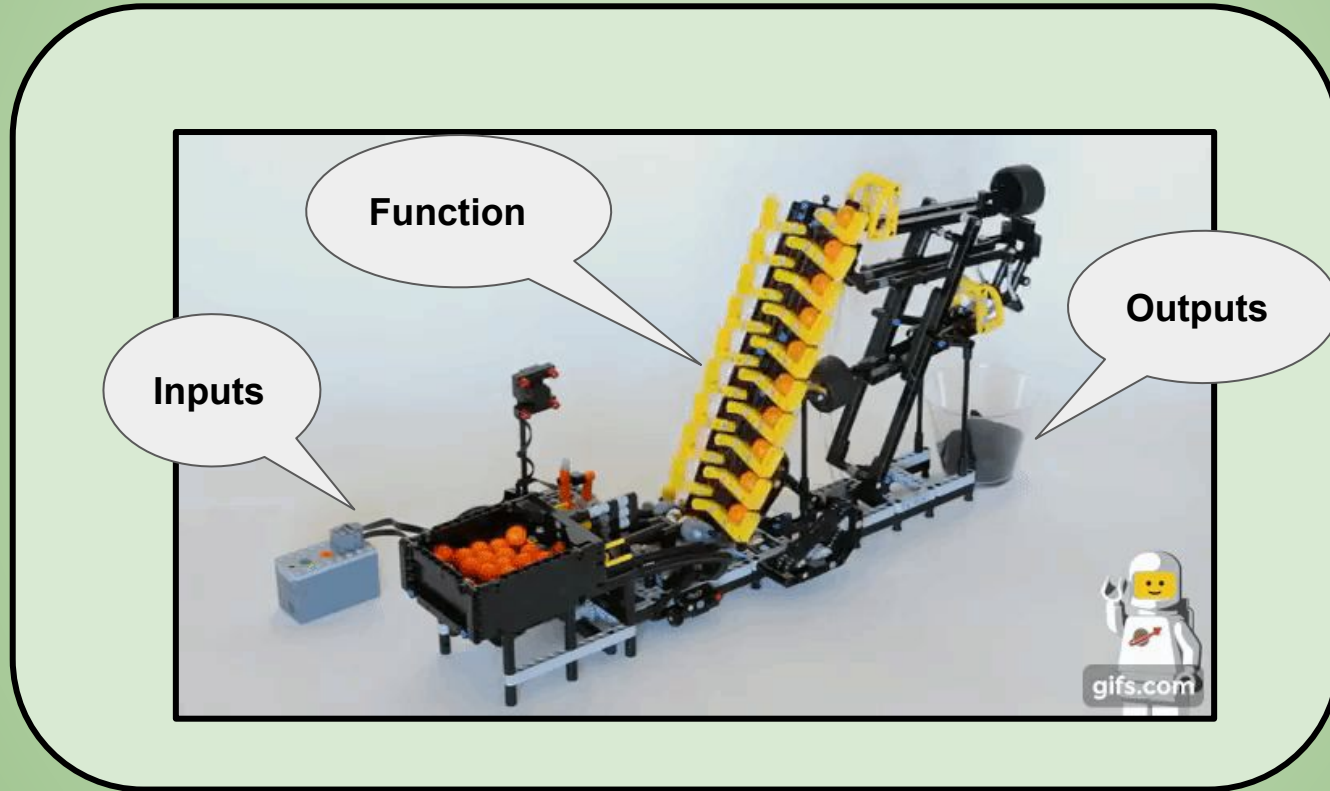
Source Code:
PSL's? Their totes my fave

Compiler Error:
There's no way I'm
translating that, Chad.

Interpreter / Compiler



Functions



Libraries and Frameworks

Libraries

You use various pieces of the library in your code

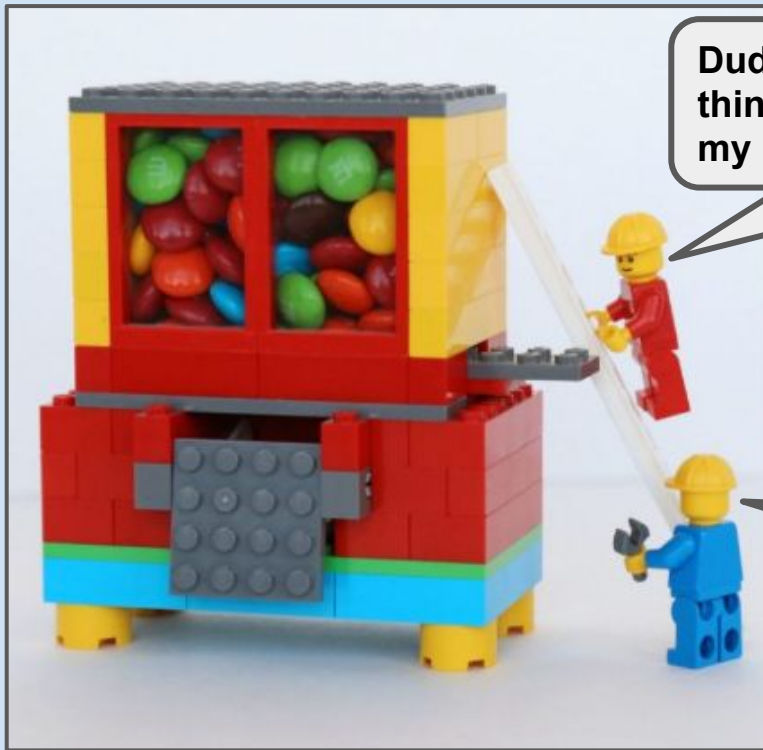


Frameworks

Your code runs inside of the framework



Application Programming Interface



Dude, check this thing out!!1 this thing dispenses M&M's the size of my head!

This could change the way we build castles altogether! If only we could unlock its secrets...

Go forth and do great things!

