

Welcome to Introduction to Python!



Hello! A Bit About This Class



Lesson 1

Variables and Types
(Integers, Floats,
Strings, Boolean)

Lesson 2

Flow Control
(If Else Statements,
Conditions)

Lesson 3

Loops!
(For loops, While
Loops)

Lesson 4

Turtle Graphics
(Art with Python)

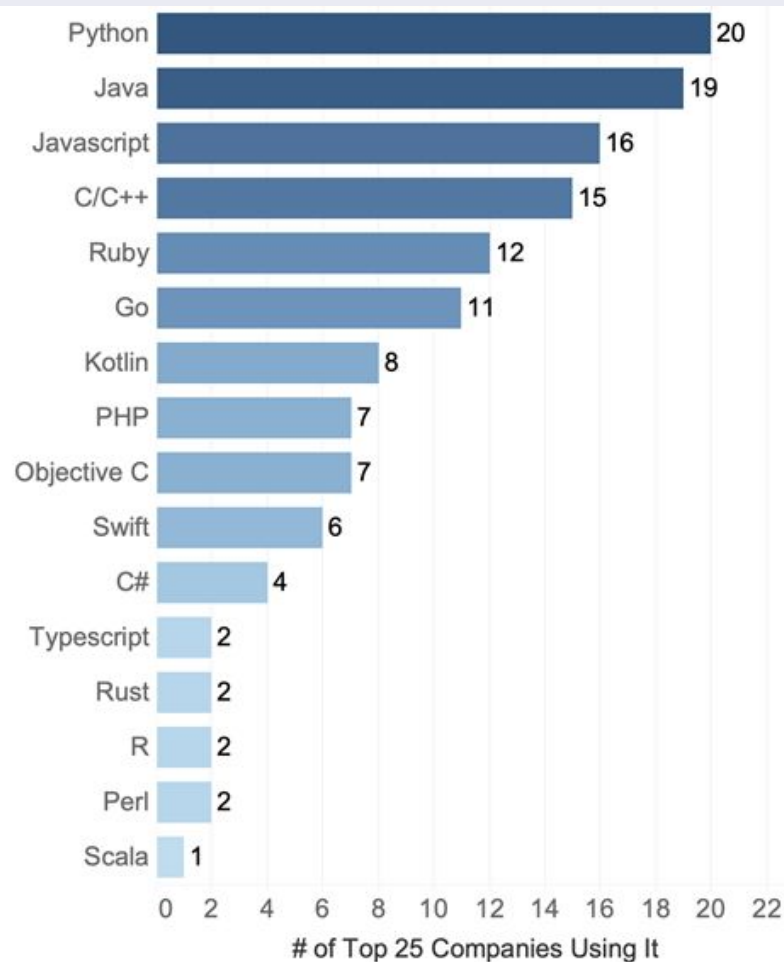
► What is Python?

1. a large heavy-bodied non-venomous constrictor snake occurring throughout the Old World tropics.
2. **a high-level general-purpose programming language.**

▶ What is Python?

- ▶ Available for all ages
- ▶ Good for lots of different points
- ▶ A fun programming language (whether beginners or not)

Why Python?



Data was gathered May 1st, 2019 - May 10th, 2019 using information from Indeed.com job postings and technologies listed on Stackshare.io

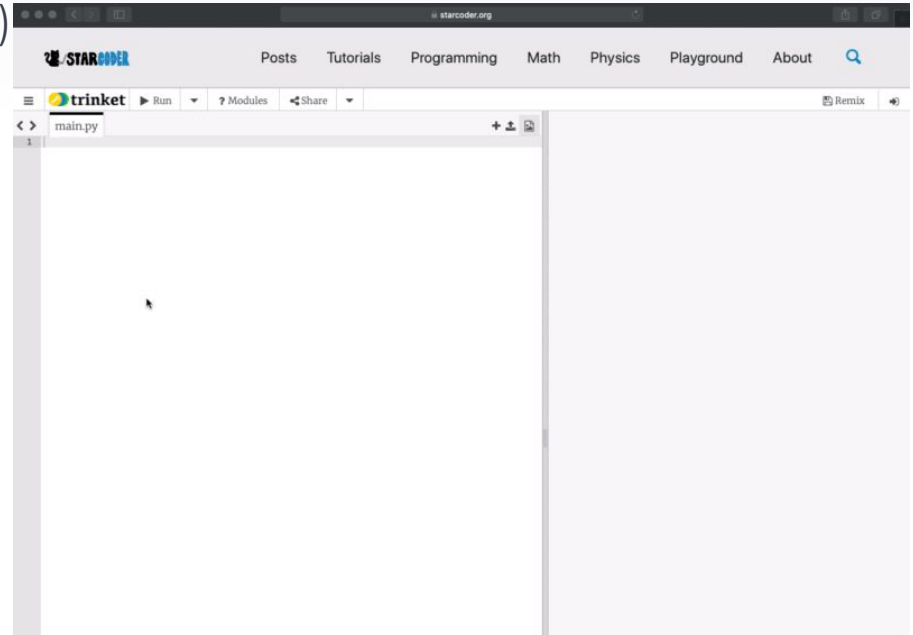
Where Should I Access Python?

[https://starcoder.org
/playground/](https://starcoder.org/playground/)



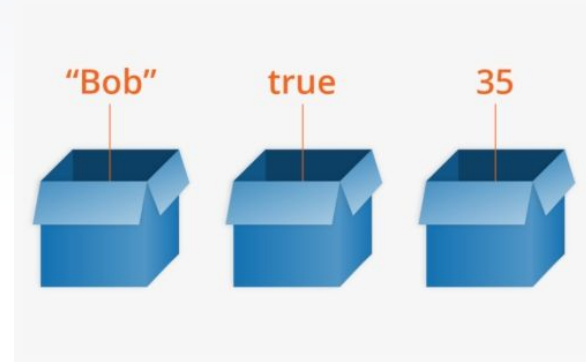
Your First Program

- ▶ Open Playground
(<https://starcoder.org/playground/>)
- ▶ Type in `print("Hello World!")`
- ▶ Click Run!



▶ Variables

- ▶ Variable: A named container which holds a value
- ▶ Value Types: Int, Float, String, Bool



Naming Conventions

- ▶ A variable name must
 - ▶ start with a letter or the underscore character
 - ▶ cannot start with a number
 - ▶ Can only contain alpha-numeric characters and underscores (A-z, 0-9, and _)

- ▶ Variable names are case-sensitive

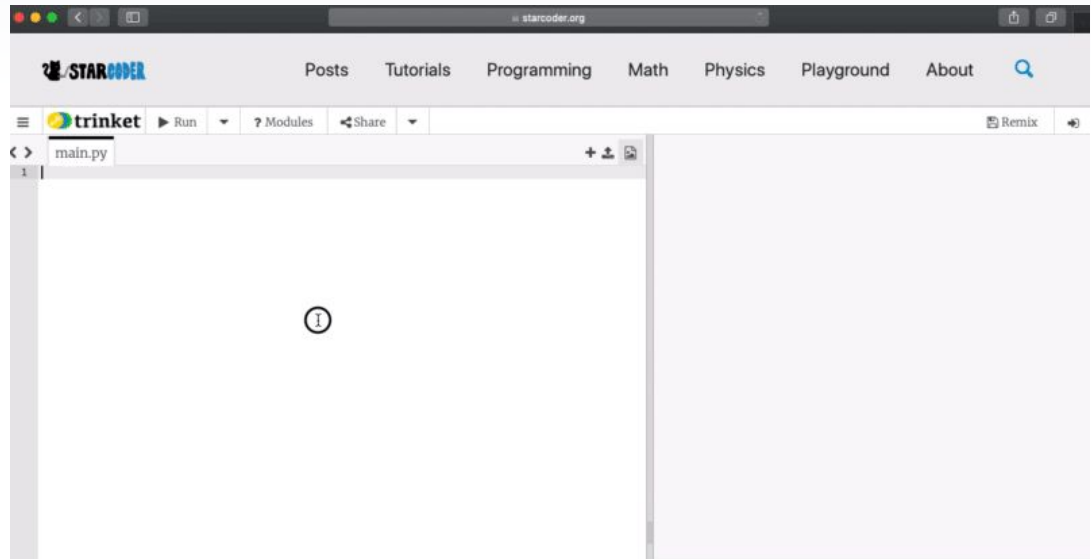
Cat cat cAt caT

Are all different variables!

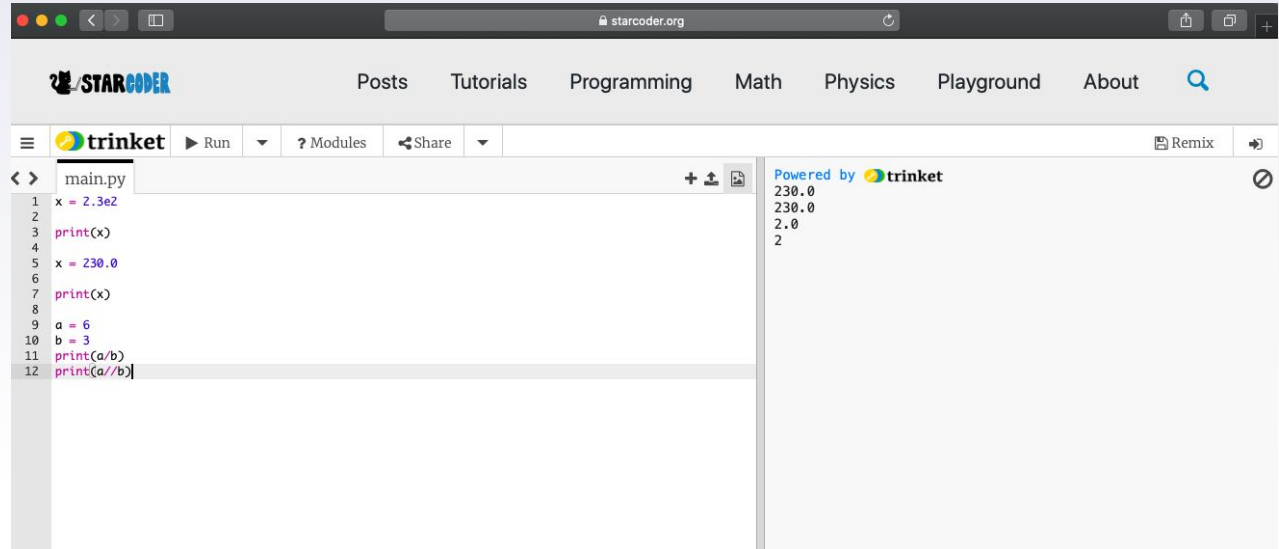
```
< > main.py
1 #Legal variable names:
2 myvar = "John"
3 my_var = "John"
4 _my_var = "John"
5 myVar = "John"
6 MYVAR = "John"
7 myvar2 = "John"
8
9 #Illegal variable names:
10 Zmyvar = "John"
11 my-var = "John"
12 my var = "John"
13
```

Integers and Operations

- ▶ Integer: Counting numbers, 0, and negative numbers (-2, -1, 0, 1, 2...)
- ▶ Integer Operations
 - ▶ +, -, *, /, //
 - ▶ "/" results in a float



Floats



The screenshot shows a web browser window with the URL starcoder.org. The page features a navigation menu with links for Posts, Tutorials, Programming, Math, Physics, Playground, and About. Below the navigation is a toolbar with a hamburger menu, the trinket logo, a Run button, a Modules dropdown, a Share button, and a Remix button. The main area is a code editor with a file named main.py containing the following Python code:

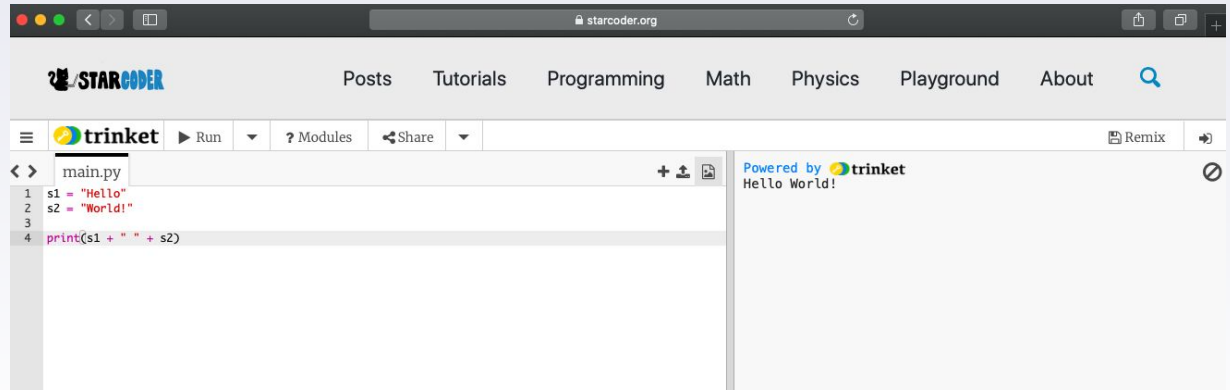
```
1 x = 2.3e2
2
3 print(x)
4
5 x = 230.0
6
7 print(x)
8
9 a = 6
10 b = 3
11 print(a/b)
12 print(a//b)
```

To the right of the code editor is a terminal window showing the output of the code:

```
Powered by trinket
230.0
230.0
2.0
2
```

- ▶ Float: Decimals
- ▶ Different Representations
 - ▶ Decimal Way (standard)
 - ▶ Scientific Representation ($10^2 = e2$)
- ▶ `"/"` returns a float (even if int)

Strings



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```
1 s1 = "Hello"  
2 s2 = "World!"  
3  
4 print(s1 + " " + s2)
```

The output of the code is displayed on the right side of the editor: "Hello World!".

- ▶ String: a sequence of characters surrounded by quotation marks
 - ▶ Can be anything (alphabet, numbers, special characters, etc)
- ▶ "Hello World" = 'Hello World'
(“Hello World” ← invalid!)
- ▶ String Concatenation using “+”

String Indexing

- ▶ Index: a single character in the string
 - ▶ Every character as an item
 - ▶ Starts at 0
 - ▶ "Hello World" Index 4 = "o"
- ▶ Indexing: Finding the Index at a certain position
- ▶ String length: `len(stringName)`
 - ▶ Final index
- ▶ Spaces do count as characters!

str = "HELLO"				
H	E	L	L	O
0	1	2	3	4

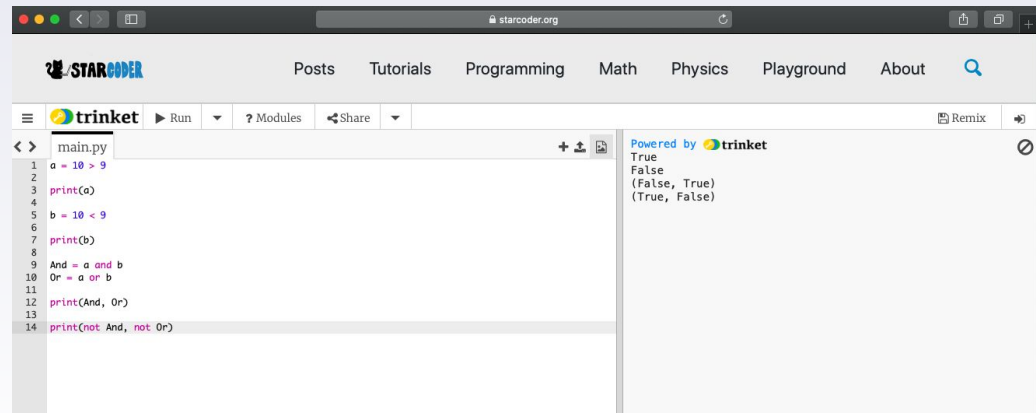
str[0] = 'H'
str[1] = 'E'
str[2] = 'L'
str[3] = 'L'
str[4] = 'O'

String Slicing

- ▶ Slicing - Cutting up a string into different pieces
 - ▶ Taking one portion
 - ▶ Substring
- ▶ [starting index:ending index + 1]

str = "HELLO"				
H	E	L	L	O
0	1	2	3	4
str[0] = 'H'	str[:] = 'HELLO'			
str[1] = 'E'	str[0:] = 'HELLO'			
str[2] = 'L'	str[:5] = 'HELLO'			
str[3] = 'L'	str[:3] = 'HEL'			
str[4] = 'O'	str[0:2] = 'HE'			
	str[1:4] = 'ELL'			

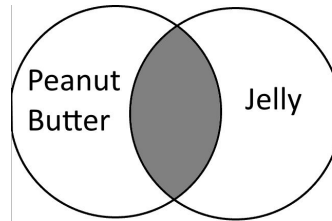
Boolean



```
main.py
1 a = 10 > 9
2
3 print(a)
4
5 b = 10 < 9
6
7 print(b)
8
9 And = a and b
10 Or = a or b
11
12 print(And, Or)
13
14 print(not And, not Or)
```

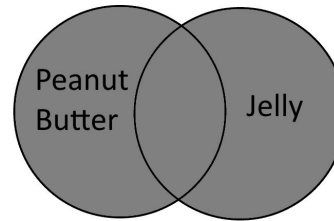
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True
False
(False, True)
(True, False)

- ▶ Boolean: True or False value
- ▶ Boolean operators
 - ▶ And
 - ▶ Or
 - ▶ Not



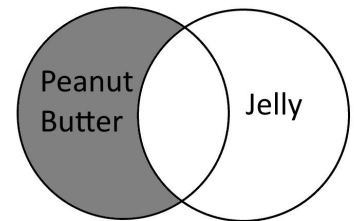
AND

Using AND, this search would only retrieve results with Peanut Butter and Jelly.



OR

Using OR, this search would retrieve results with peanut butter, with jelly, and with both.



NOT

Using NOT, this search would retrieve results with peanut butter, and exclude those with jelly or PB with jelly.



Examples and Problems!

Type Your Answers in the Chat



Is 123cat a valid variable name?

No, it starts with a number.



Is num\$1 a valid variable name?

No, it contains a non-alphanumeric item.

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```
1 string = "Intro To Python"
2
3 print(string[6])
```

Below the code editor is an output area with the text "Powered by trinket" and a question mark, indicating that the code has not been executed or the output is unknown.

What does this code print?

It prints out T

starcoder.org

STARCODER Posts Tutorials Programming Math Physics Playground About

trinket Run ? Modules Share

main.py


```
1 print(True and False)
2
3 print(not True or False)
```

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?

What does this code print?

It prints out False, False



Bonus: What does “e” stand for in floats? Give an example

e stands for the scientific notation, or 10^x . I.e. $2e2 = 200$, or $3e1 = 30$



Extra Content

▶ Conversions

- ▶ Turning one type into another
 - ▶ Only applies to certain types
- ▶ `type()`
- ▶ `int()`, `str()`, `bool()`, `float()`

► Quick Quiz!

<https://forms.gle/TwavN1ivsttCKrxWA>