Python

Debugging, Intro to Python Data Types, & Joan Clarke

01
COHORT 2 GROUND RULES

Cohort 2 Ground Rules

Keep Noise Levels Down
(always raise your hand to ask a question, and wait to talk to friends until we're coding)

Having The Option to Not Talk In Front of Everyone

Explain New Things

Being Kind to Others

No Bullying, Be Respectful

No Judgment

No Assigned Seats

Pair Programming
(working with a partner)

Being Able to Pick Your Own Groups
(if we do group things)

Help Your Neighbor

Remember:
We're All Learning

Help Me Help You

01
COHORT 3 GROUND RULES

Cohort 3 Ground Rules

Having Fun

No Assigned Seats

Being Kind to Others

Be Respectful of Differences

Pair Programming
(working with a partner)

Coding as a Community

No Being Mean or Bullying

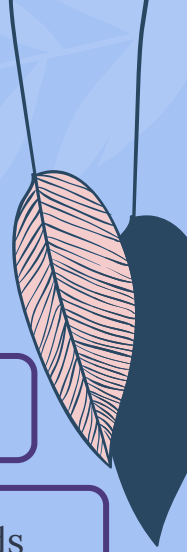
No Judgment

Making New Friends

Help Your Neighbor

Remember:
We're All Learning

Help Me Help You



02

DEBUGGING

DEBUGGING - What does it mean?

“DE”

- A prefix
- Means to **undo something.**

DEBUGGING - What does it mean?

"ING"

- A suffix (end of the word)
- Shows an **action currently in progress.**

DEBUGGING - What does it mean?

DE-"BUGG"-ING

- It really does stand for...

The first computers...

Rubber Duck Method (yes, it's real)

- Talk out your coding problem with your rubber duck buddy.
- This helps your brain to process the problem differently.
- **Follow these steps:**
  - Talk about what the code is doing (line by line)
  - Talk about what it *should be doing*.

03
DEBUGGING: UNPLUGGED

USE YOUR DUCK

- Use your duck to step through the suggested path to the pond.
- Which step is wrong? Correct it!
- **There will only be 1 wrong step.** There are a million ways to get your duck to water, so be creative with the **steps provided.**

04

SHERO

SHEro - Joan Clarke

- Went to school in London, England but wasn't allowed to actually earn her degree.
- Recruited to the **Government Code and Cypher School** where she became a **code breaker** during the war.
- She played a huge role in breaking "The Enigma", saving 220,000 tons of shipping per month.

04

INTRO TO PYTHON

JavaScript

Like JavaScript, can be used to build websites and software.

More frequently used for **automating** tasks, math, and analyzing data.

au-to-mate

verb

1. Convert (a process or facility) largely automatic operation

JavaScript

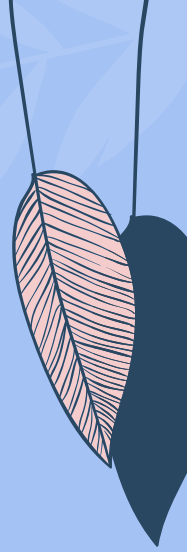
Like JavaScript, can be used to build websites and software.

More frequently used for **automating** tasks, math, and analyzing data.

au-to-mat-ic

adjective

1. (of a device or process) working by itself with little or no direct human control
2. Done or occurring spontaneously, without conscious thought or intention

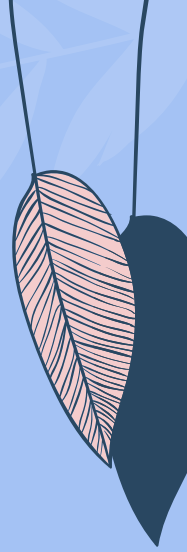


Python is...

- Considered **general-purpose**.
  - It can be used in a variety of different types of programs - it's not specialized or customized for any one thing

What else makes it cool?

- It's simple.
- It works on different operating systems.
- It looks like English, so it's easier to understand.
- The code can be run as soon as it's written.



05

TYPES OF VARIABLES

Data Types

Represent different types of data - strings, numbers, boolean, etc. A string is wrapped in quote marks (example: “green eggs and ham”). Numbers look like numbers, and booleans are true/false, YES or NO.

Guess the Data Type:

- “coders”	STRING
- 101	NUMBER
- “true”	STRING
- false	BOOLEAN
- “208”	STRING

Data Types

Variables always have a data type.

Once a variable is given a data type, **it cannot be changed.**

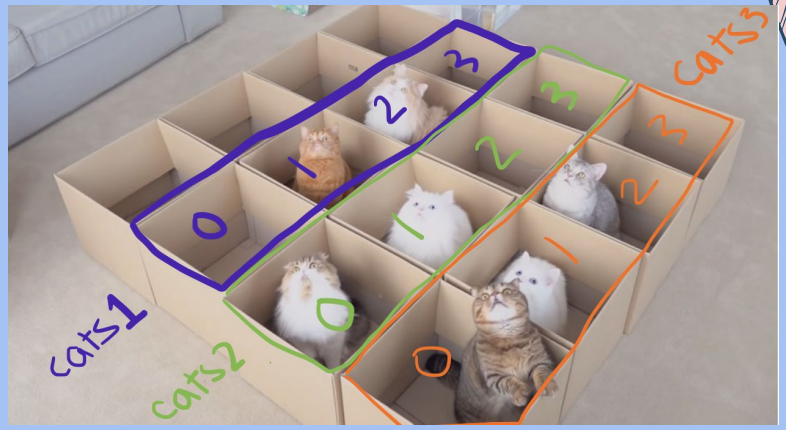
Example: **cats = 3**

But what if we wanted to represent a row of boxes, that are also full of cats? We would use what is called an **array**!

Data Types - Array

Array. A single variable that stores a series of elements. Each element in your array has to be the same data type (all numbers or all strings).

To access things in an array, you use an **index**. The index is an item's order or position in the array, and it will always start at 0 (instead of 1).



Array Example: Grocery List

My grocery list:

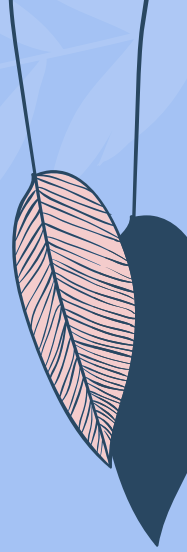
- Apple
- Mango
- Banana
- Grape
- Blueberry
- Kiwi
- Papaya

Because “apple” is first on my grocery list, it’s position will be **0.**

Array Example: Grocery List

Accessing an item at an array's index looks a lot like this: **fruits[2].**

fruits[2] - the word "fruits" is the name of our array variable



Array Example: Grocery List

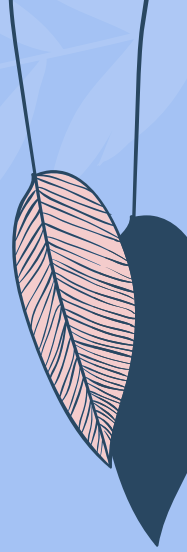
Accessing an item at an array's index looks a lot like this: **fruits[2].**

fruits[2] - the opening and closing brackets tell our code that we want the index (number inside)

Array Example: Grocery List

Accessing an item at an array's index looks a lot like this: **fruits[2].**

fruits[2] - 2 is the actual index



Array Example: Grocery List

Given the example, what is **fruits[2]**?

What index holds the **blueberries**?

Exercise: Grocery List (THREE VOLUNTEERS)

How would I get the **apple**?

The array is called **fruits**

Exercise: Colors (THREE VOLUNTEERS)

The array is called **colors**

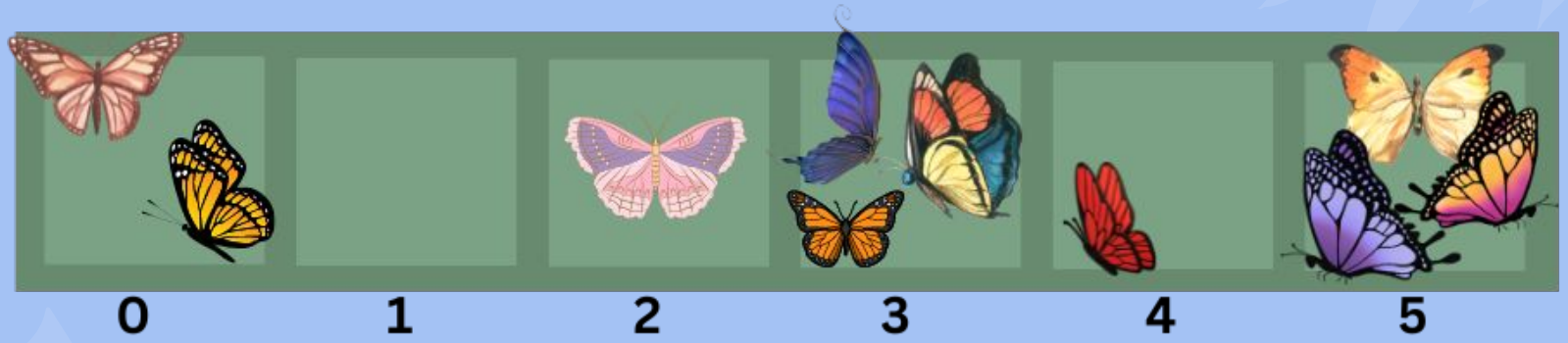
```
red = colors[0]
```

```
orange = colors[1]
```

Group #1: How would I get the **yellow**?

Group #2: How would I get the **purple**?

Exercise: Colors (THREE VOLUNTEERS)



The array is called **butterflies**

```
butterflies[0] = 2
```

Group #1: What is `butterflies[1]`?

Group #2: How do I get 3 butterflies?

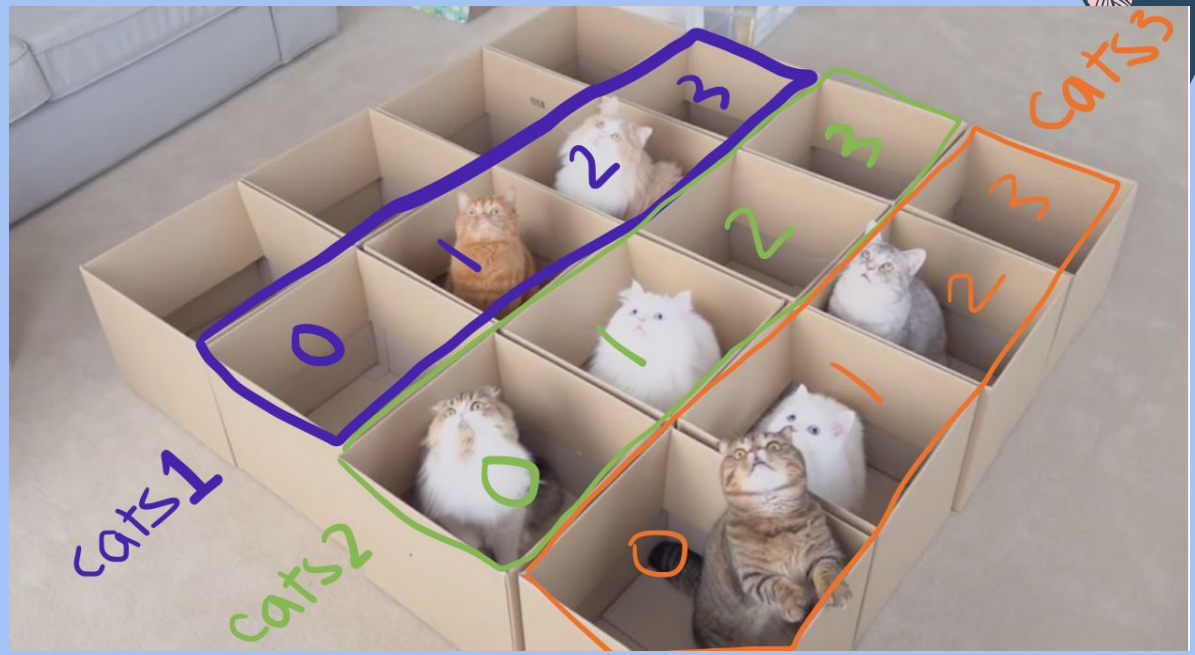
Data Types - Array

cats1 = the purple array

cats2 = the green array

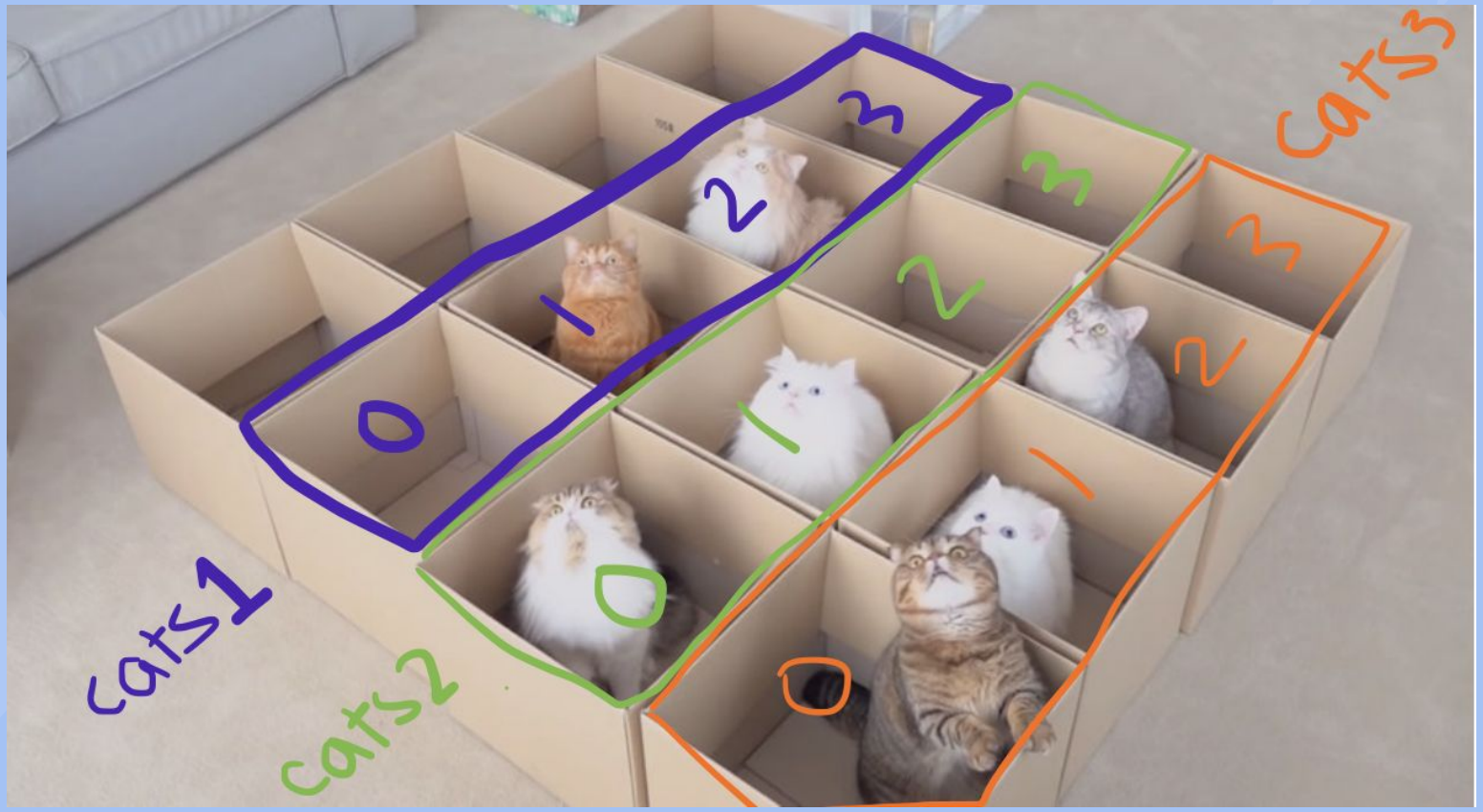
cats3 = the orange array

In order to pick up a cat and snuggle it, I have to select the correct array and index.



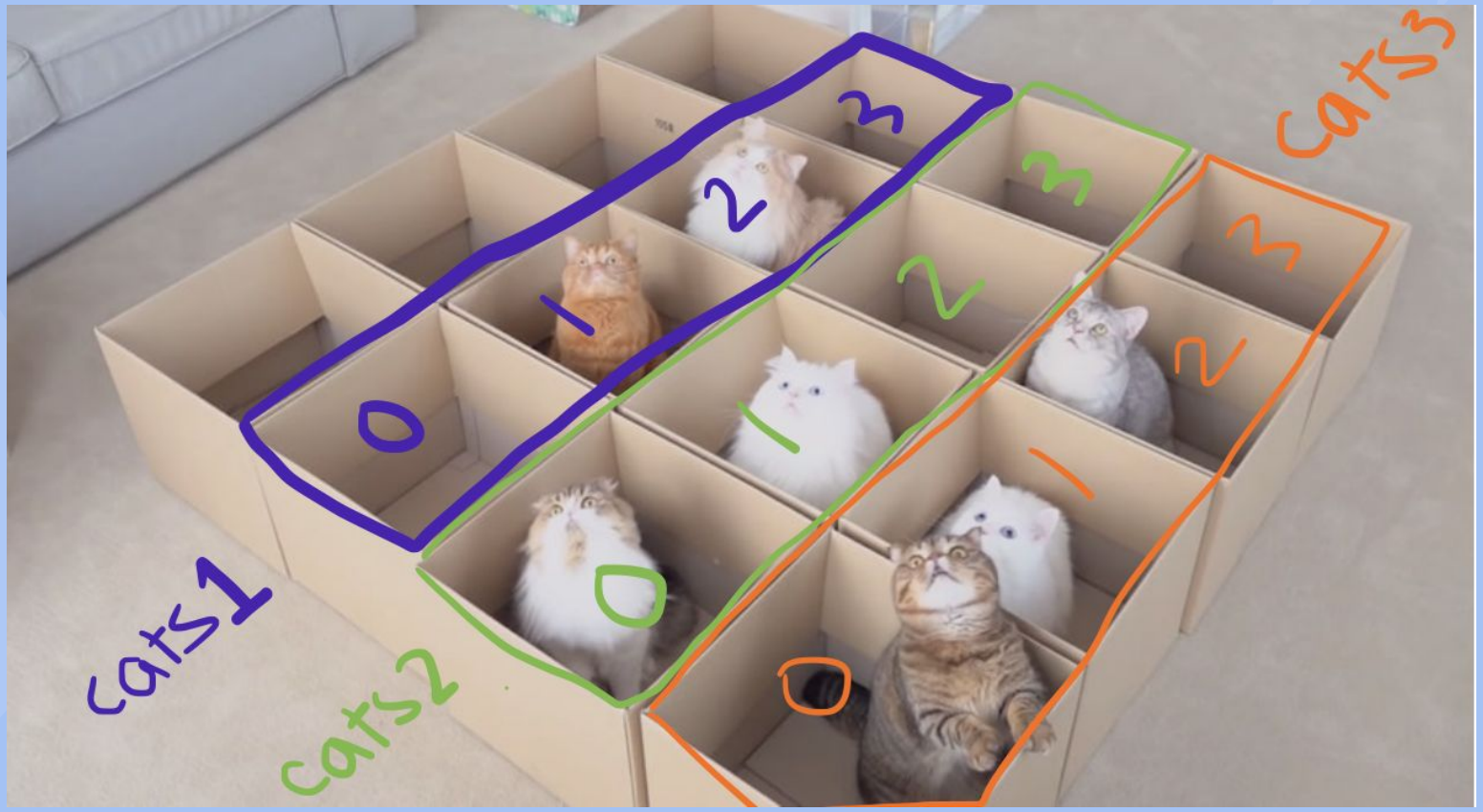
Data Types - Array

cats2[2]



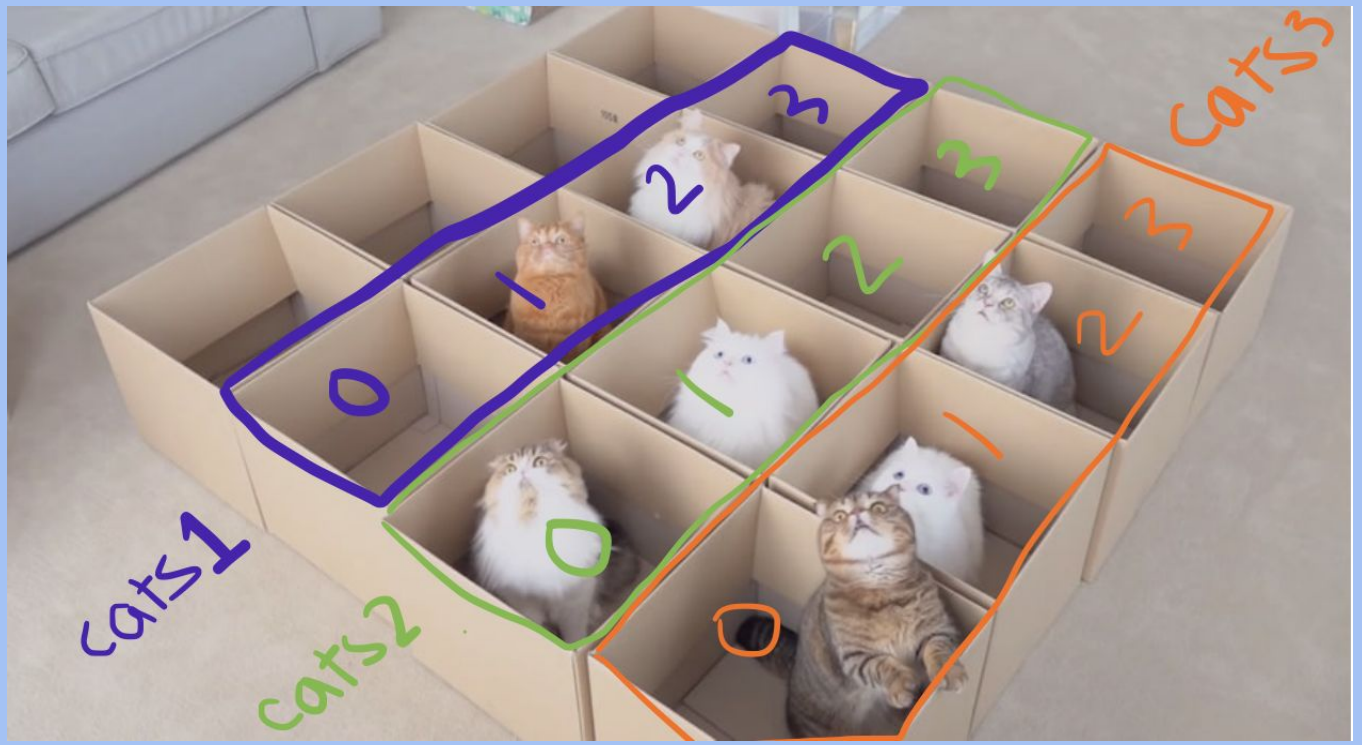
Data Types - Array

cats3[0]



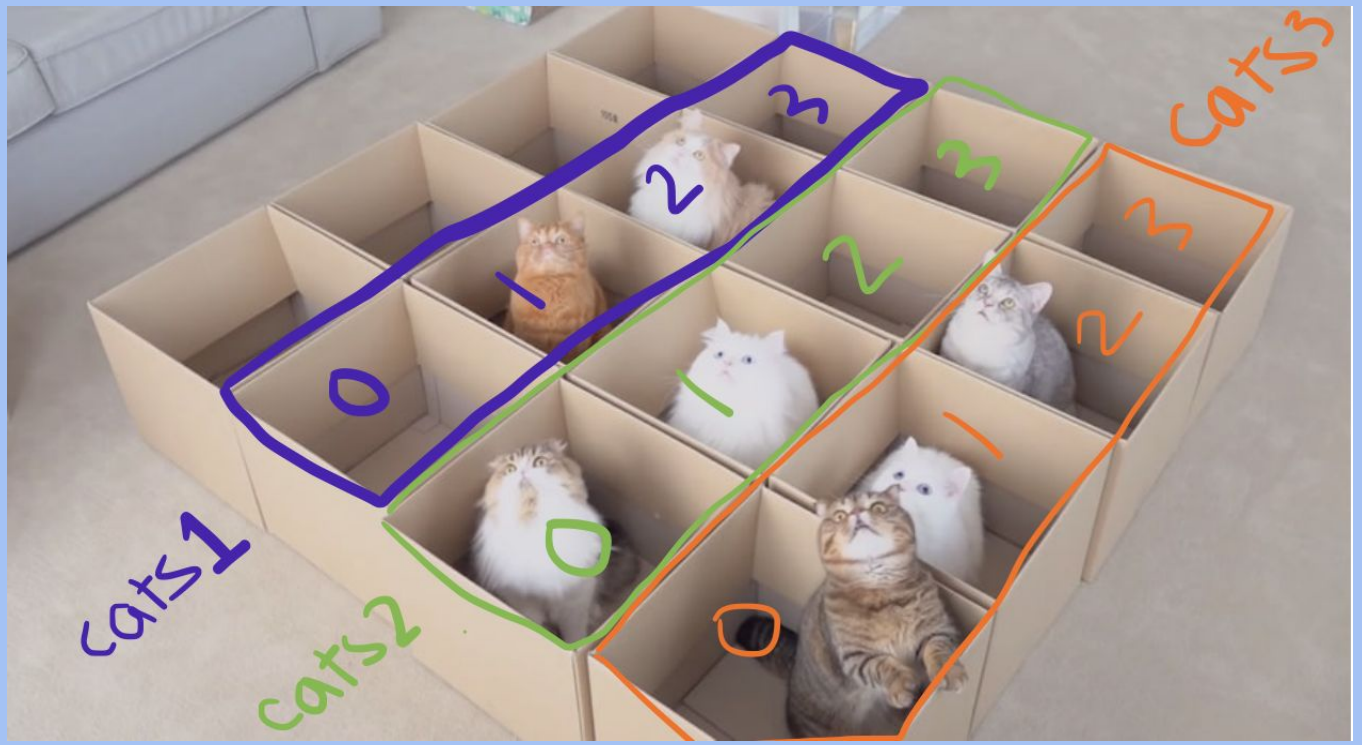
Exercise: Cats in Boxes (THREE VOLUNTEERS)

Tell me how to pick up an **orange cat**.



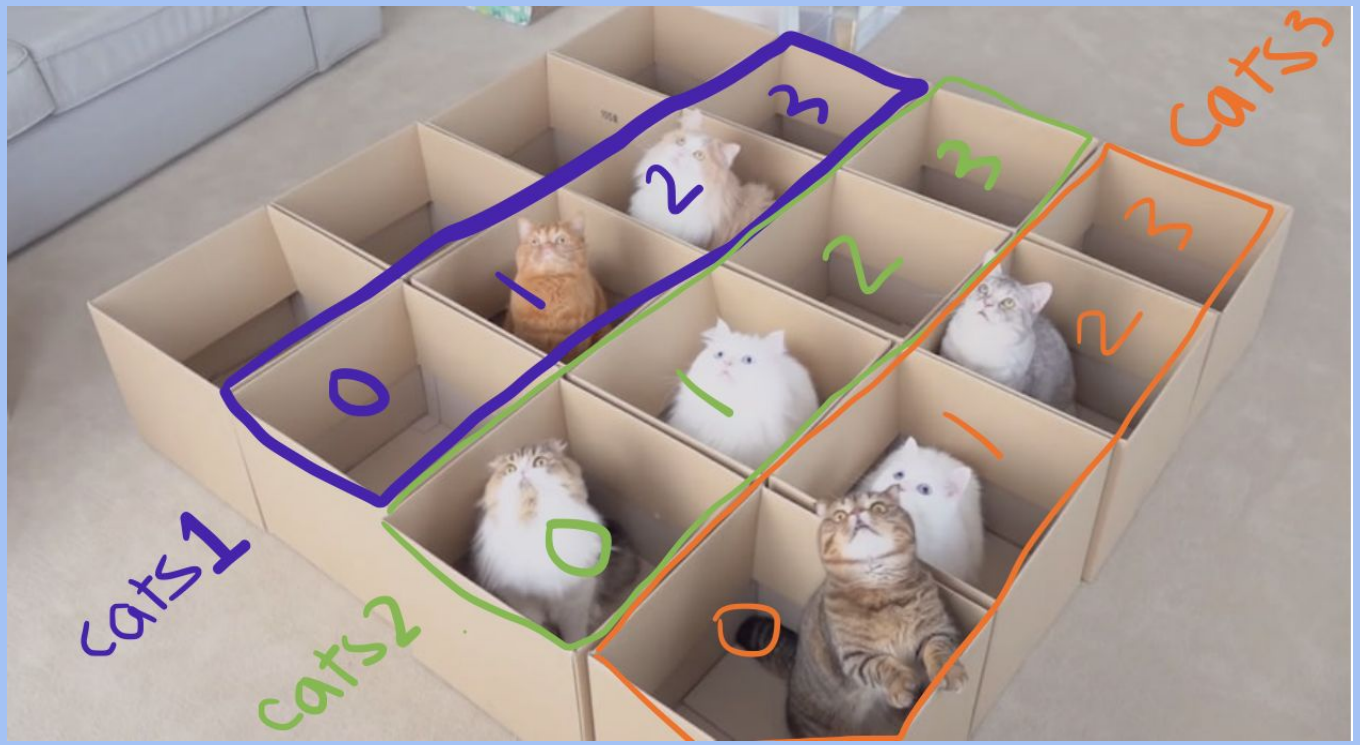
Exercise: Cats in Boxes (THREE VOLUNTEERS)

Tell me how to pick up a **gray and white cat**.



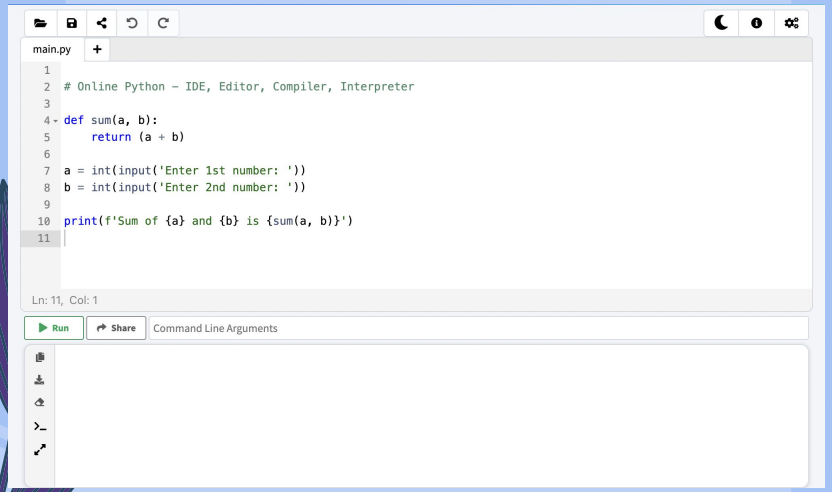
Exercise: Cats in Boxes (THREE VOLUNTEERS)

Tell me how to pick up a **cat with long hair**.



Let's Practice!

A CodePen is already open for you. You are logged into the Girls Code Club account! Raise your hand if you need help.



In Python, you can print things using **print( ).** Please let us know if you can't find your console.

Coding Exercise #1

Write the following code in JavaScript (also in your packet):

main.py +

```
1  colors = ["red", "pink", "green", "yellow", "purple", "orange", "blue"]
2  print(colors[0])
3  print(colors[5])
4  # print the rest of the colors below this line!
5
```

Use **print( )** to print out the colors, in the order they would appear in a rainbow (ROYGBIV). For example, if you typed **print(colors[0])**, what would you get?

Coding Exercise #2

Create an array with the ingredients for a sandwich (not this one, be creative):

main.py +

```
1  sandwich = ["bread", "peanut butter", "jelly", "more bread"]
2  print("To start making my sandwich, lay out two slices of " + sandwich[0])
3  # print the rest of the instructions below!
4
```

Run | Share | Command Line Arguments

```
To start making my sandwich, lay out two slices of bread
```

Coding Exercise #3

Create an array that tells us about your morning routine.

main.py +

```
routine = ["feed the cats", "medicate the cats", "get dressed", "brush my teeth",
    "rub my eyes", "make coffee"]
print("The first thing I do every morning is " + routine[0])
# print the rest of the instructions below!
```