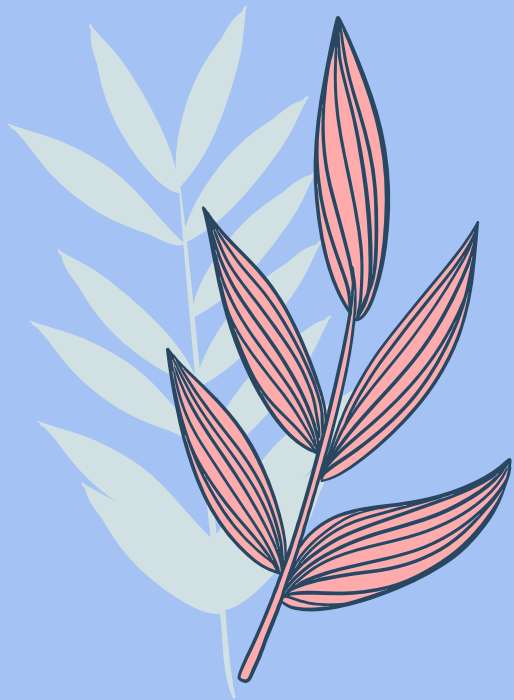


The background of the slide is a light blue color with a pattern of various tropical leaves. The leaves are drawn in a simple, stylized manner with black outlines. Some leaves are filled with colors like pink, purple, green, and dark blue, while others are just white outlines. The leaves are scattered across the slide, with some in the corners and others more centrally located.

Python

Debugging, Intro to Python Data
Types, Google Logos, Grace Hopper, &
Joan Clarke



01

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.**



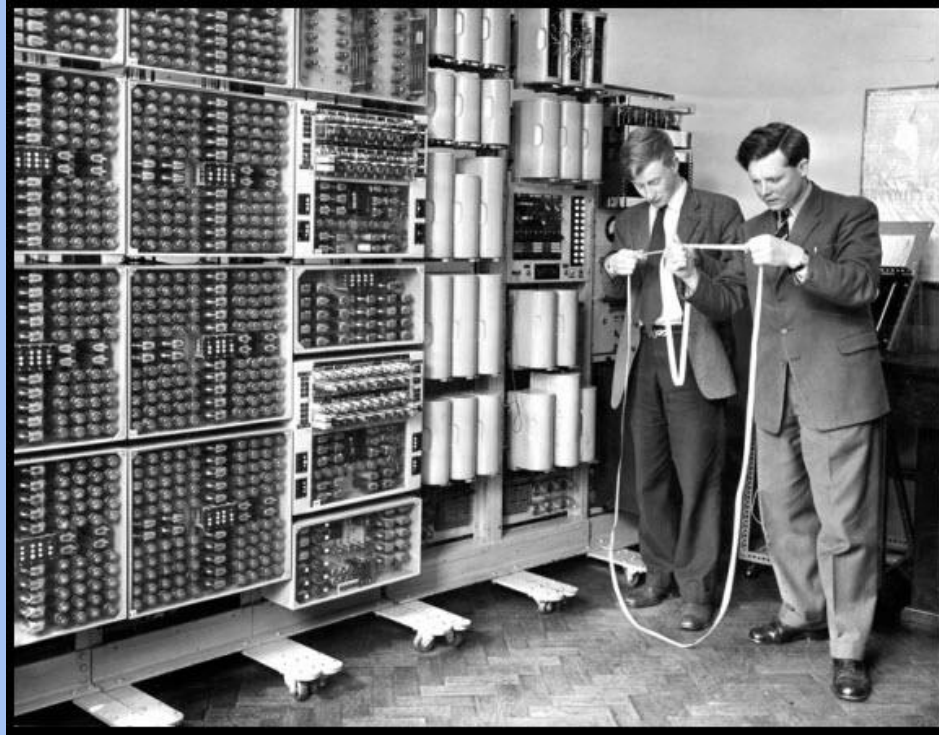
DEBUGGING – What does it mean?

DE-**"BUGG"**-ING

- It really does stand for...



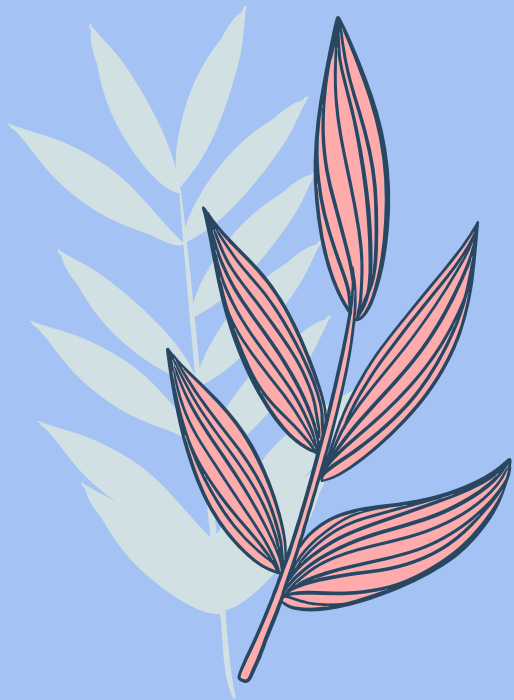
The first computers...



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*.





02 DEBUGGING: UNPLUGGED



STEP 1: PICK YOUR DUCK



If you attend Session 9, our last session, you get to take your Rubber Duck HOME!!!



- You will be dismissed by table to choose your rubber duck.
- This is **your** debugging buddy for the rest of the year!
- **Please return your duck at the end of our session.**
- I will label your duck with your name, and you'll get it back each session.

STEP 2: USE YOUR DUCK



- Page 2 in your packet
- 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.**



03 SHERO – GRACE HOPPER



SHero - Grace Hopper



- American computer scientist, mathematician, and a United States Navy rear admiral
- One of the first programmers for the Harvard Mark 1 computer, and played a huge role in what we know as **debugging**.
- She created COBOL, which is a programming language still used today.
- Fun Fact: She has a plaque here at LSF in the Hall of Heroes!

Video - <https://www.youtube.com/watch?v=Fg82iV-L8ZY>



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

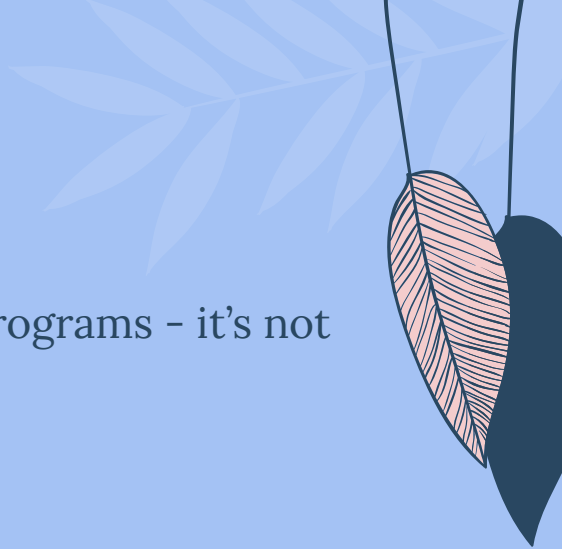
1. (of a device or process) working by itself with little or no direct human control
2. Done or occurring spontaneously, without conscious thought or intention

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

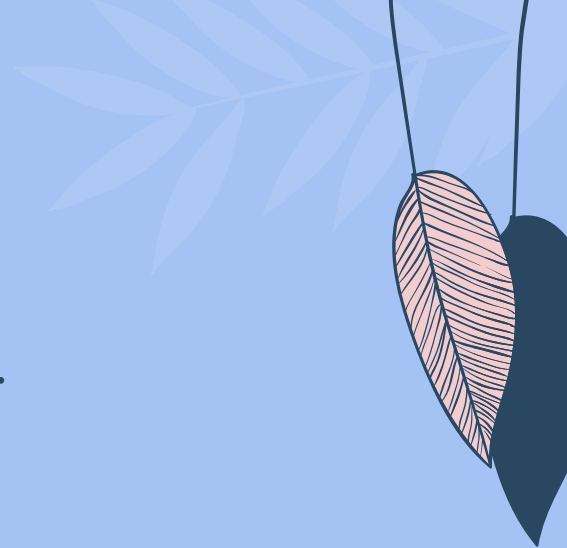
Data Types

Variables always have a data type.

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

Example: **var cats = 3**

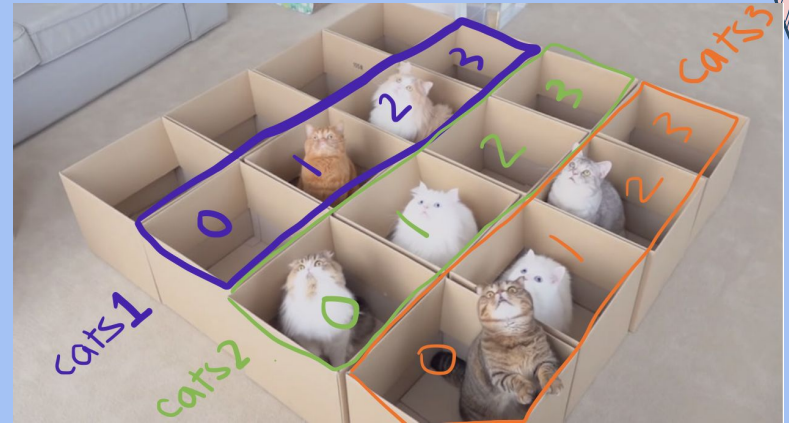
But what if we wanted to represent a row of boxes, that are also full of cats?
We would use what is called an **array**!



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).

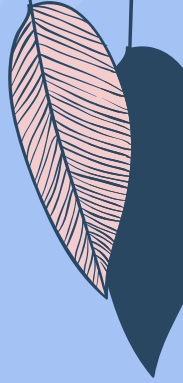


Array Example: Grocery List

My grocery list:

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

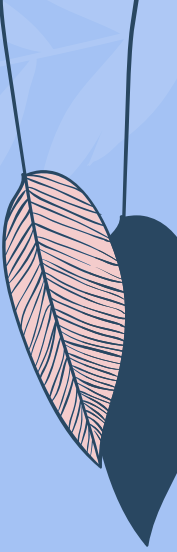
Because “apple” is first on my grocery list, its position will be **0**.



Array Example: Grocery List

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

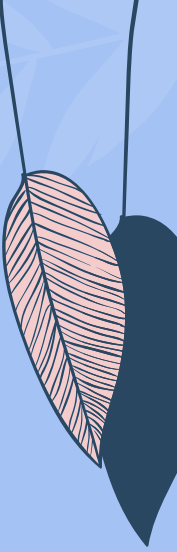
fruits[2] - the word “fruits” is the name of our array variable



Array Example: Grocery List

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

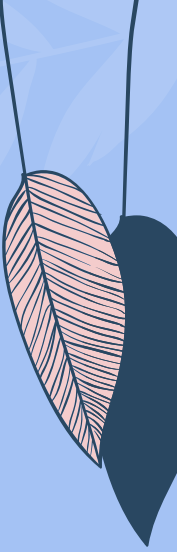
fruits[2] - the opening and closing brackets tell our code that we want the index (number inside)







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

0	1	2	3	4	5	6
						

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

What index holds the **blueberries**?

Exercise: Grocery List (THREE VOLUNTEERS)

0



1



2



3



4



5



6



How would I get the **apple**?

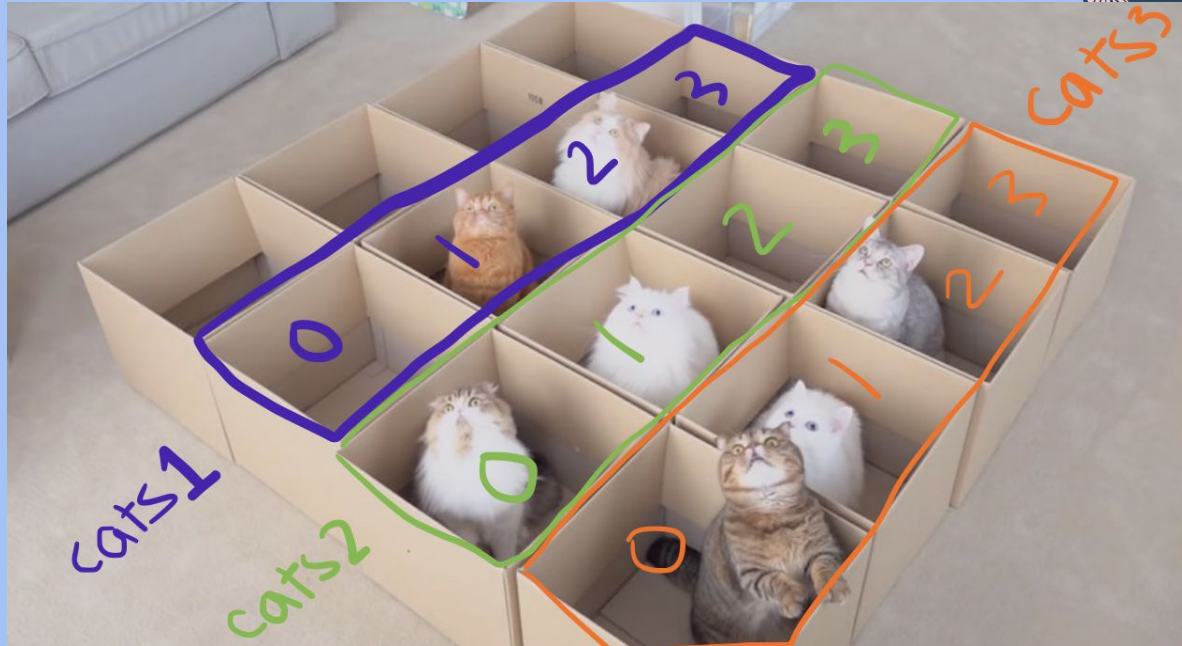
Data Types - Array

cats1 = the purple array

cats2 = the green array

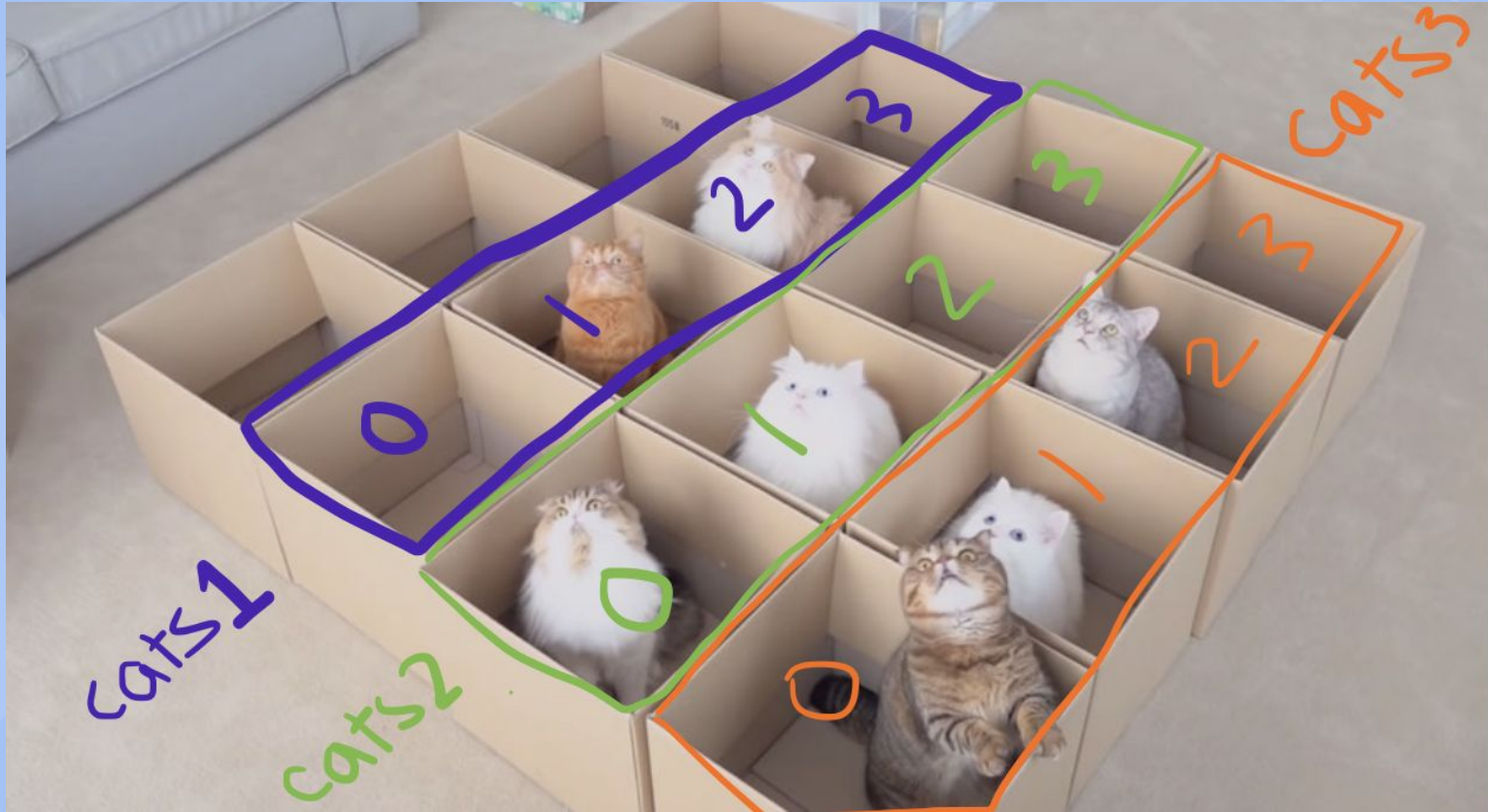
cats3 = the orange array

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



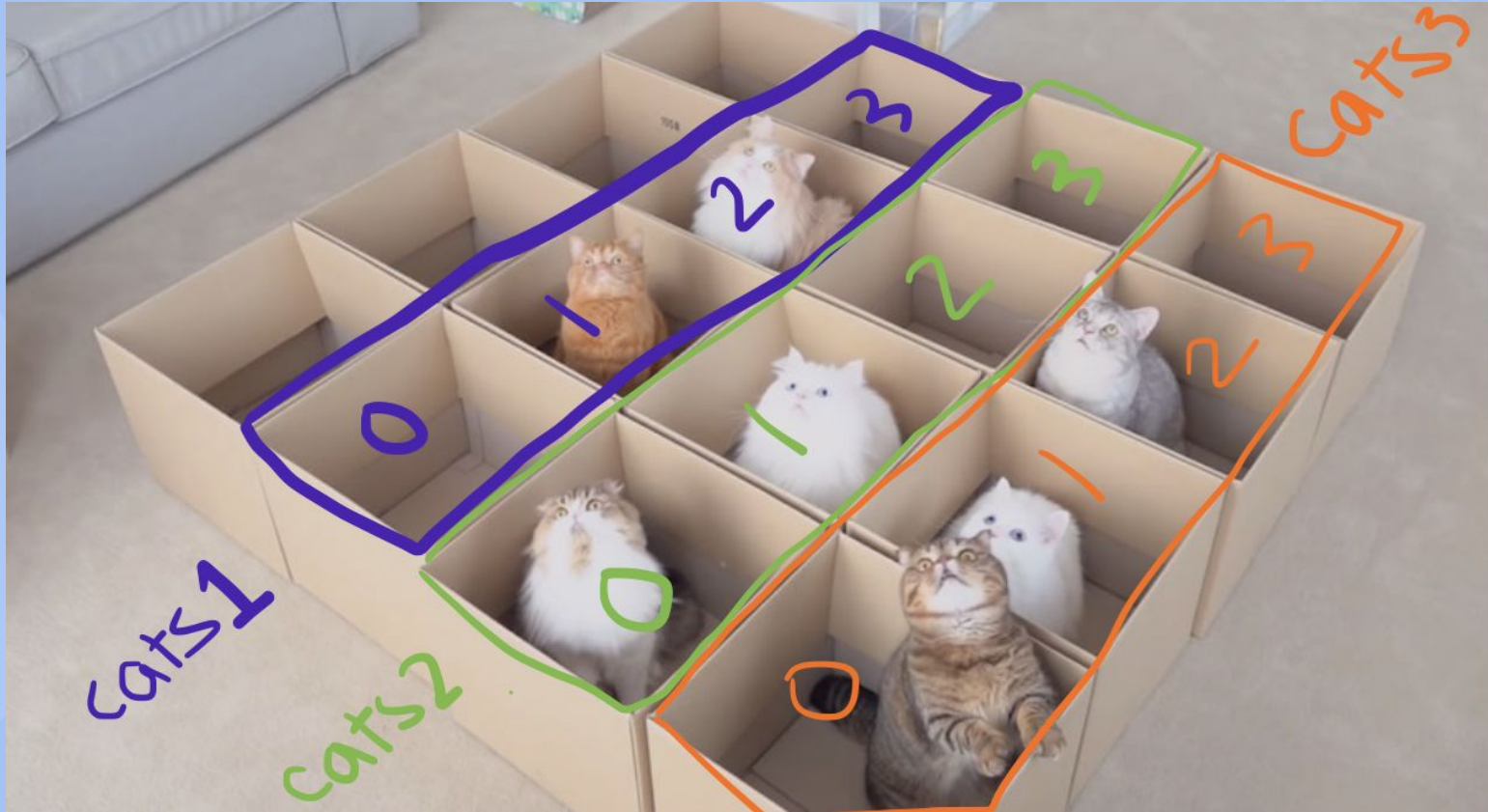
Data Types - Array

cats2[2]



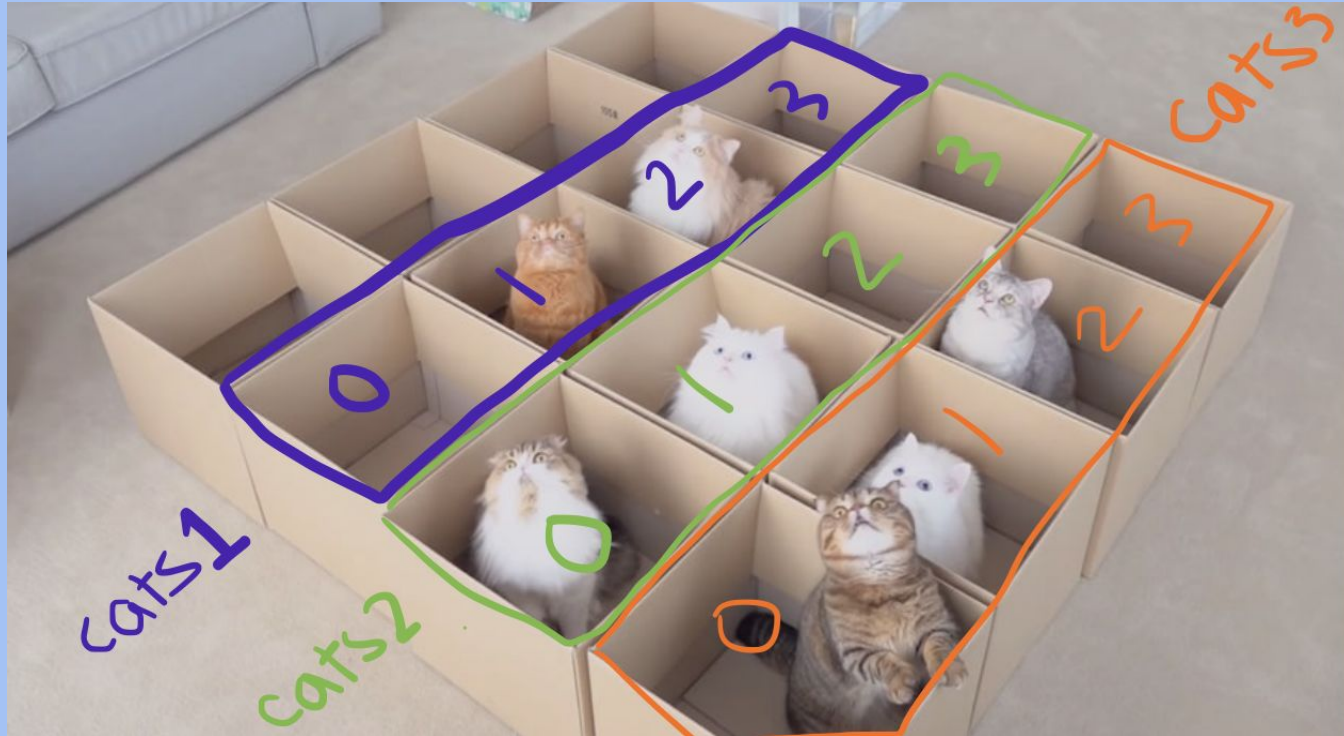
Data Types - Array

cats3[0]



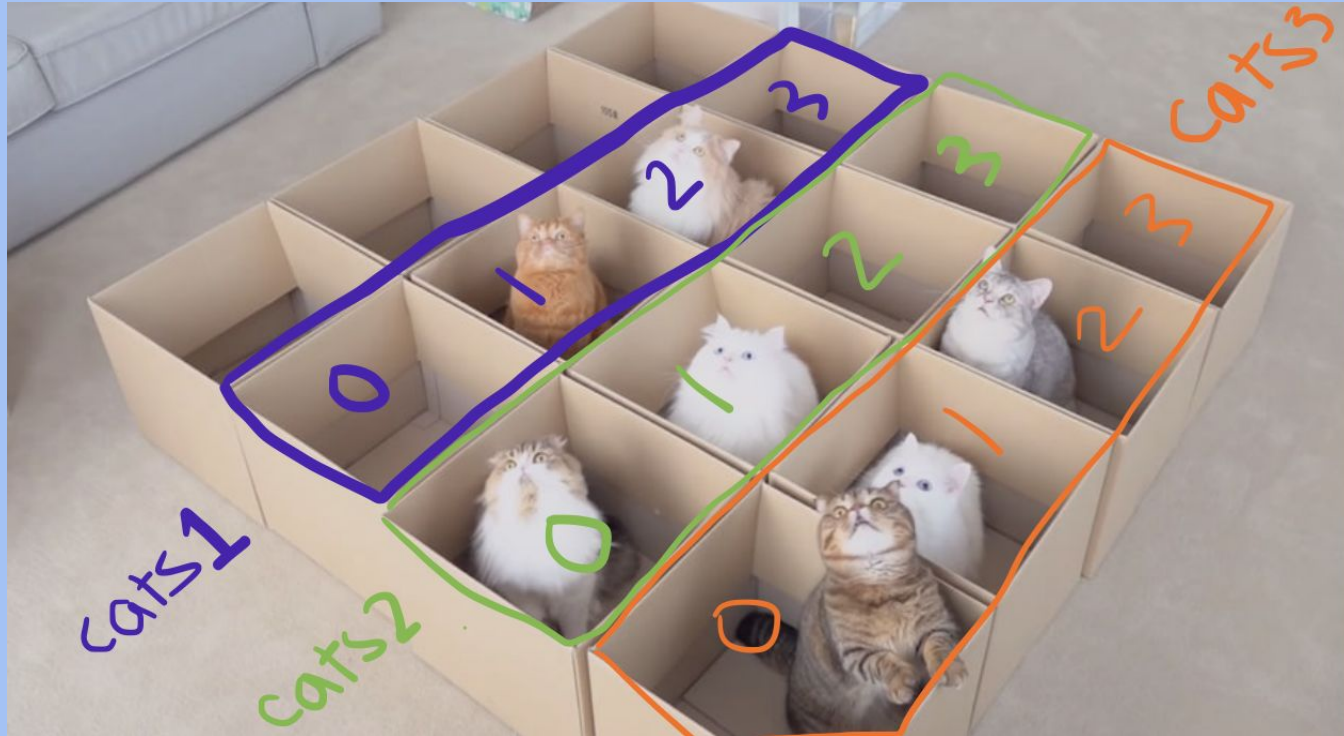
Exercise: Cats in Boxes (THREE VOLUNTEERS)

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



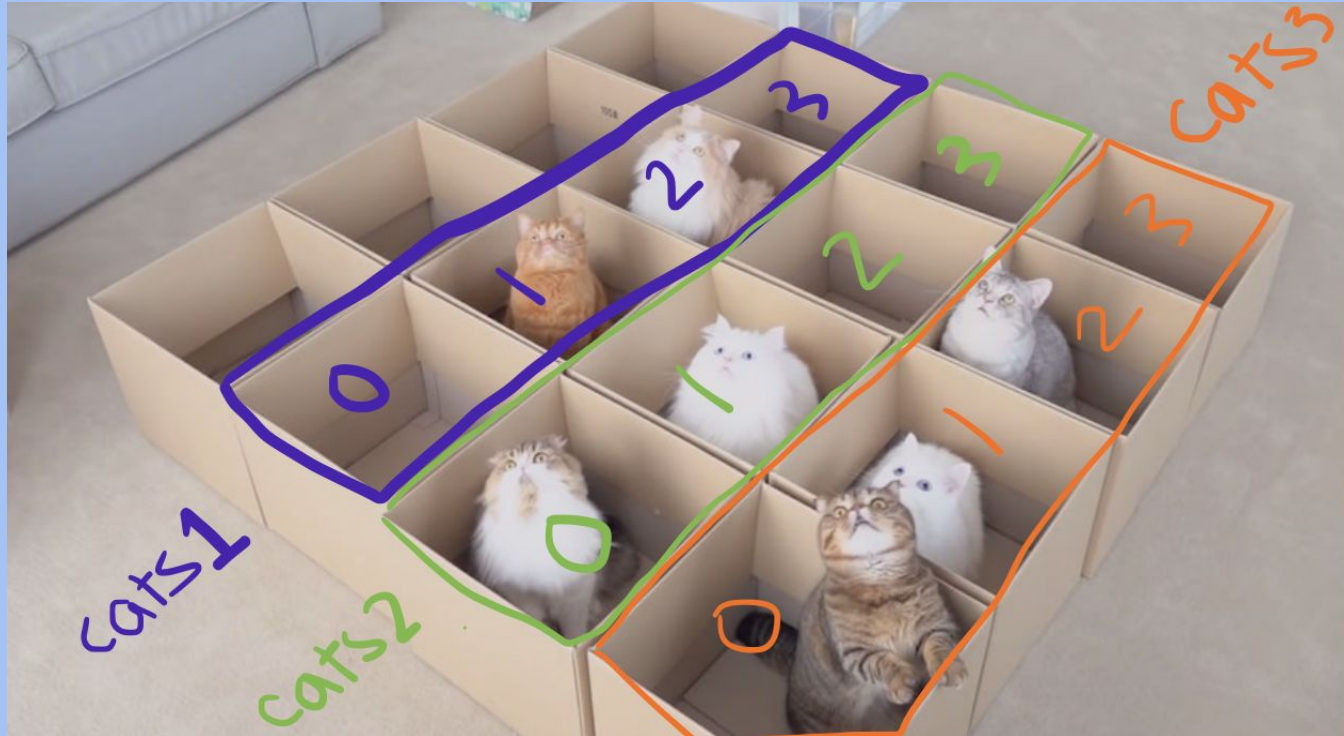
Exercise: Cats in Boxes (THREE VOLUNTEERS)

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



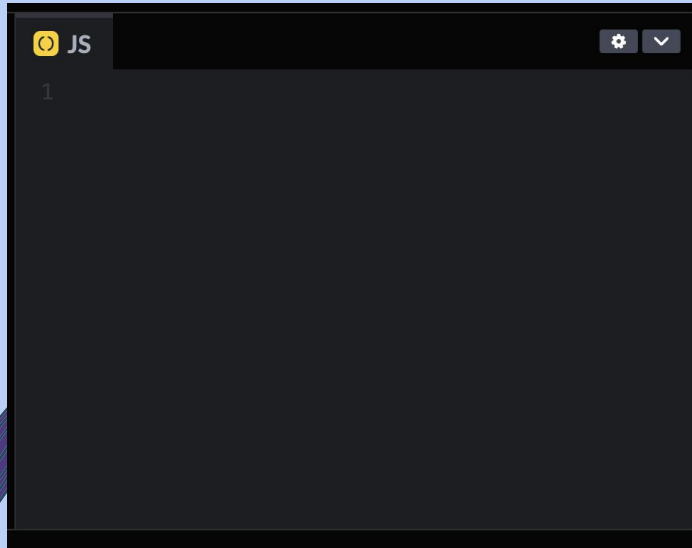
Exercise: Cats in Boxes (THREE VOLUNTEERS)

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



Let's Practice!

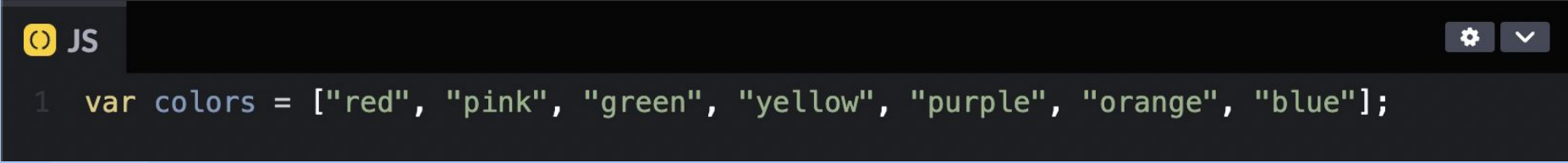
A CodePen is already open for you. You are logged into the Girls Code Club account! **Please name your CodePen using the username you made last session.** Raise your hand if you need help.



Remember that **console.log()** let's you print things out in the console at the bottom of the page. Please let us know if you can't find your console.

Coding Exercise #1

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



```
1 var colors = ["red", "pink", "green", "yellow", "purple", "orange", "blue"];
```

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

Coding Exercise #2

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



JS

```
1 var sandwich = ["bread", "peanut butter", "jelly", "more bread"];
```

Use the console to print instructions, telling me how to make your favorite sandwich. Example:



JS

```
1 var sandwich = ["bread", "peanut butter", "jelly", "more bread"];  
2 console.log("Before you make my favorite sandwich, we need " + sandwich[0] + ".");
```

Console

Clear X

```
"Before you make my favorite sandwich, we need bread."
```

>

Coding Exercise #2 (bigger example)



JS

```
1 var sandwich = ["bread", "peanut butter", "jelly", "more bread"];  
2 console.log("Before you make my favorite sandwich, we need " + sandwich[0] + ".");
```

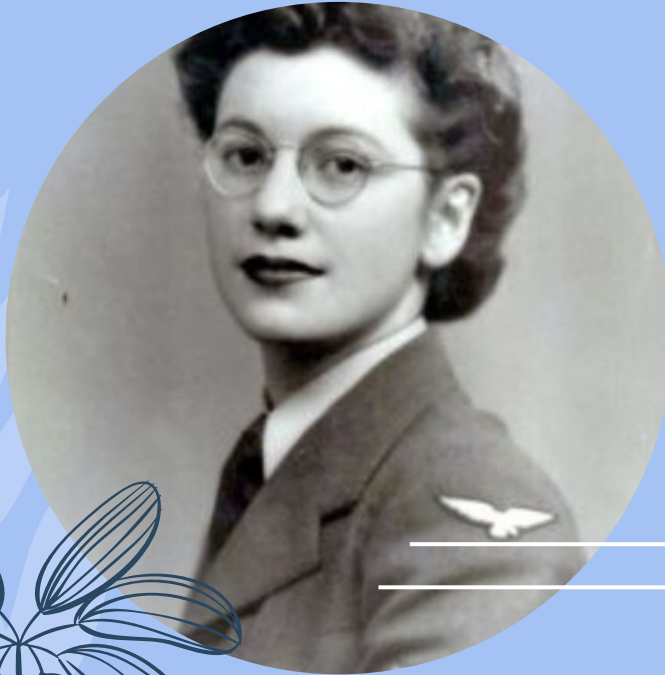


06

BONUS 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.



07

GOOGLE LOGOS



Google Logos

Doodles

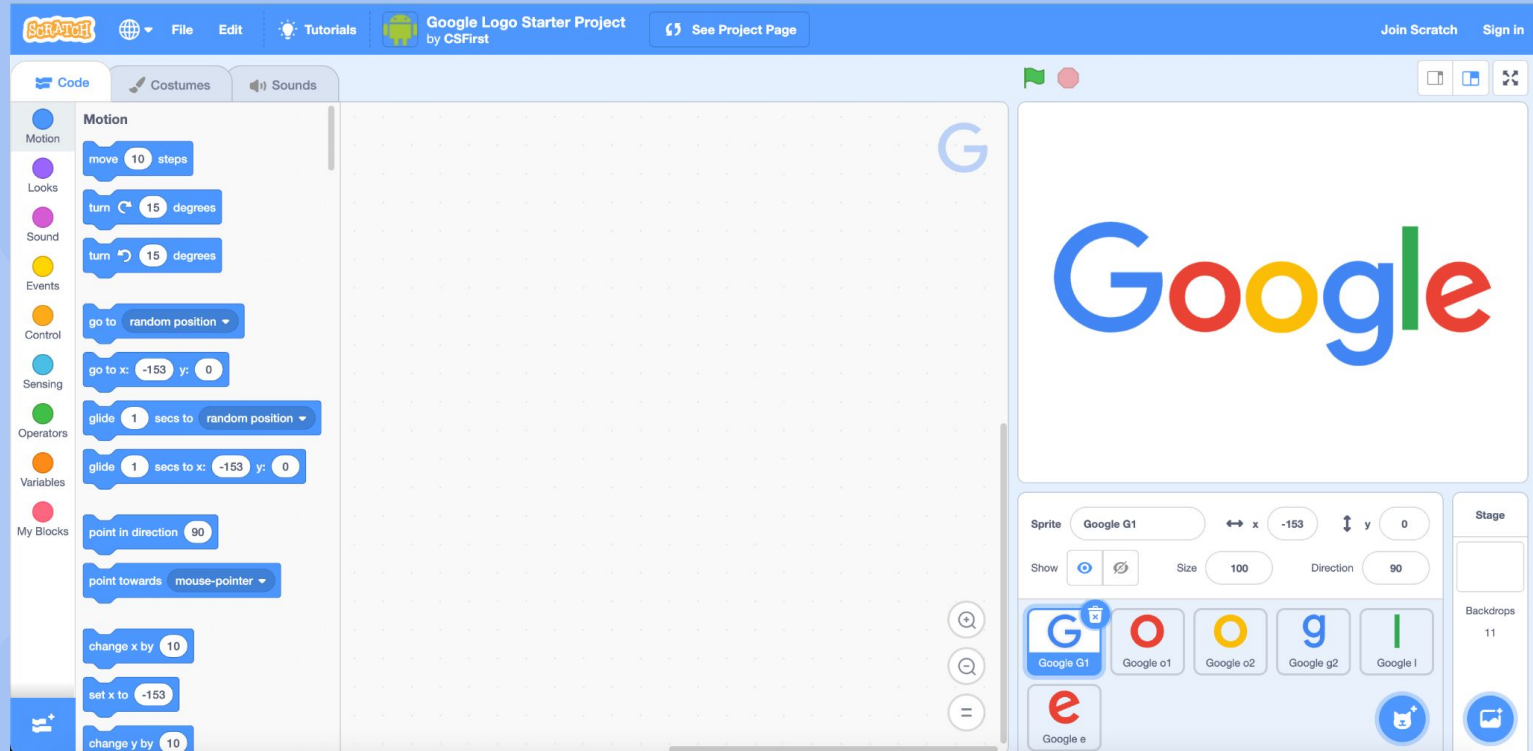
A “Google” logo is called a doodle! Scratch is used to animate the doodle.

Sprite

Each letter in the “Google” logo is called a sprite.

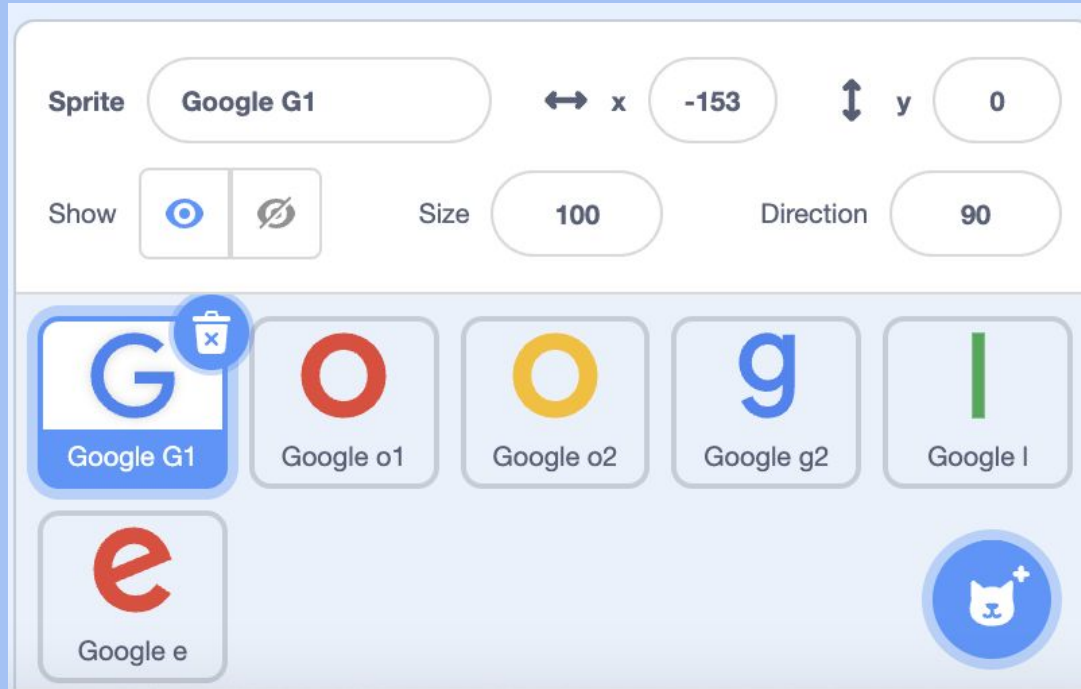
Google Logo Editor

The Scratch code is in the pane on the left.



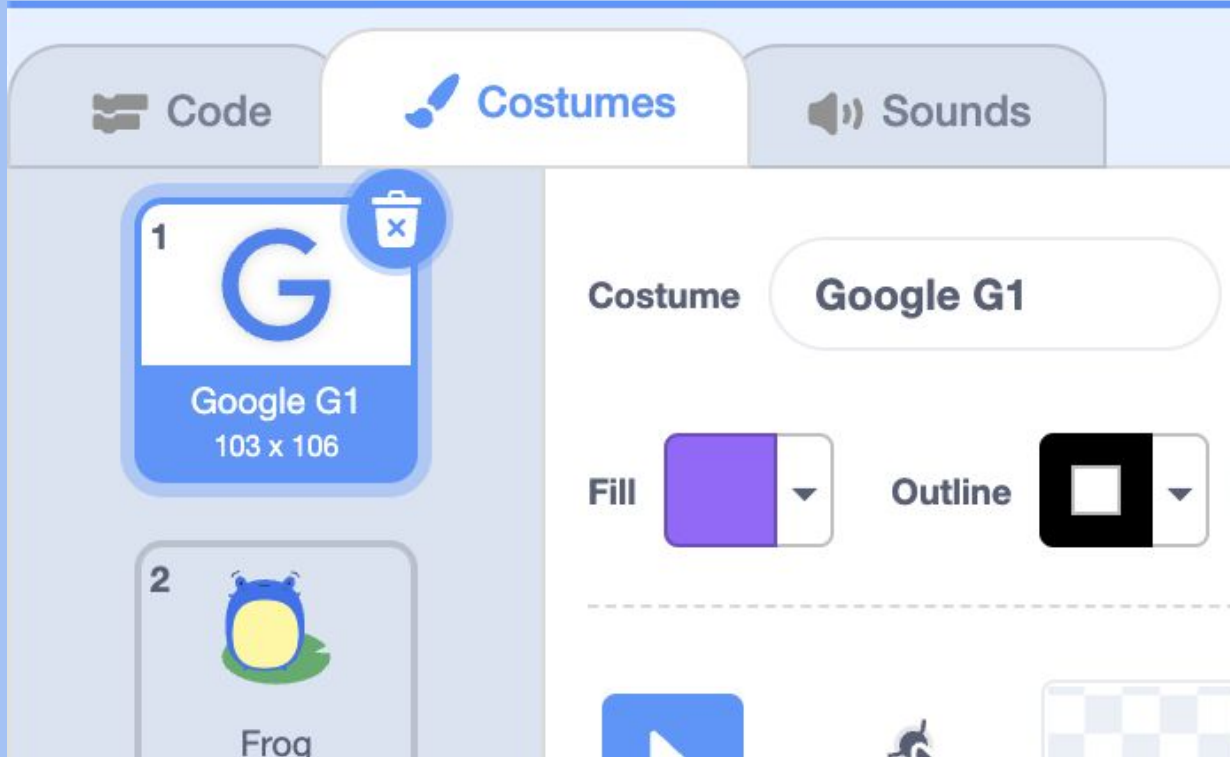
Google Logo Editor

In order to switch the letter you're working with, click on the sprite in the bottom right-hand window.



Google Logo Editor

To change a sprite's costume, click the “Costumes” tab.



Exercise #1: Change the Colors

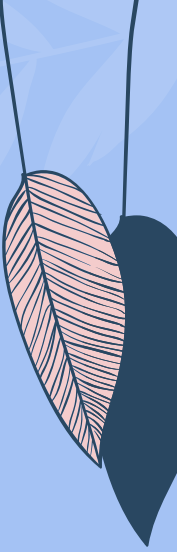
Video Tutorial=>

<https://csfirst.withgoogle.com/c/cs-first/en/create-your-own-google-logo/create-your-own-google-logo/extensions/change-color.html>

Go to =>

<https://scratch.mit.edu/projects/177224273/editor>

Exercise #2: Make your Own CUSTOM Logo!





THANKS!

CREDITS: This presentation template was created by **Slidesgo**, including icons by **Flaticon**, infographics & images by **Freepik** and illustrations by **Stories**

