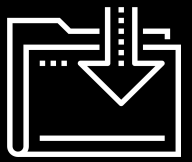
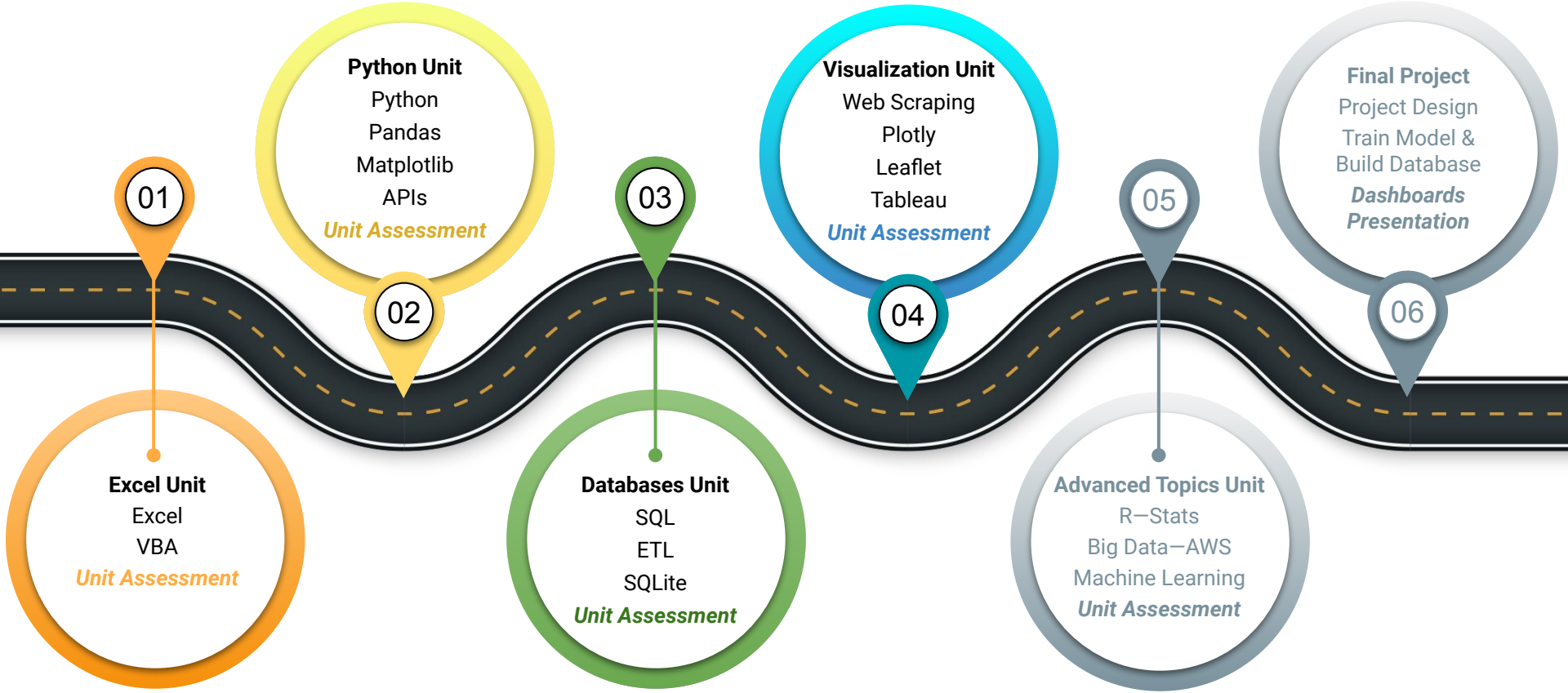
JavaScript Fundamentals

Data Boot Camp

Lesson 11.1



The Big Picture



Quick Tip for Success:

Consider teaming up with some of your classmates for virtual study groups as we get into this content!

Module 11

This Week: JavaScript Fundamentals

This Week: JavaScript Fundamentals

By the end of this week, you'll know how to:

- Explain the strengths and weaknesses of JavaScript "standard" and JavaScript version ES6+
- Describe JavaScript syntax and ideal use cases
- Build and deploy JavaScript functions, including built-in functions
- Convert JavaScript functions to arrow functions
- Build and deploy `forEach` (JavaScript `for` loop)
- Create, populate, and dynamically filter a table using JavaScript and HTML

This Week’s Challenge

Using the skills learned throughout the week, create new search parameters and new JavaScript functions for UFO data to create an updated and dynamic webpage.

Career Connection

How will you use this module's content in your career?

Module 11

How to Succeed This Week

Quick Tip for Success:

Don’t forget to lean on documentation whenever you get stuck on syntax. You’ll be making robust visualizations in no time!

Module 11

Today’s Agenda

Today's Agenda

By completing today's activities, you'll learn the following skills:

01 JavaScript variables and objects

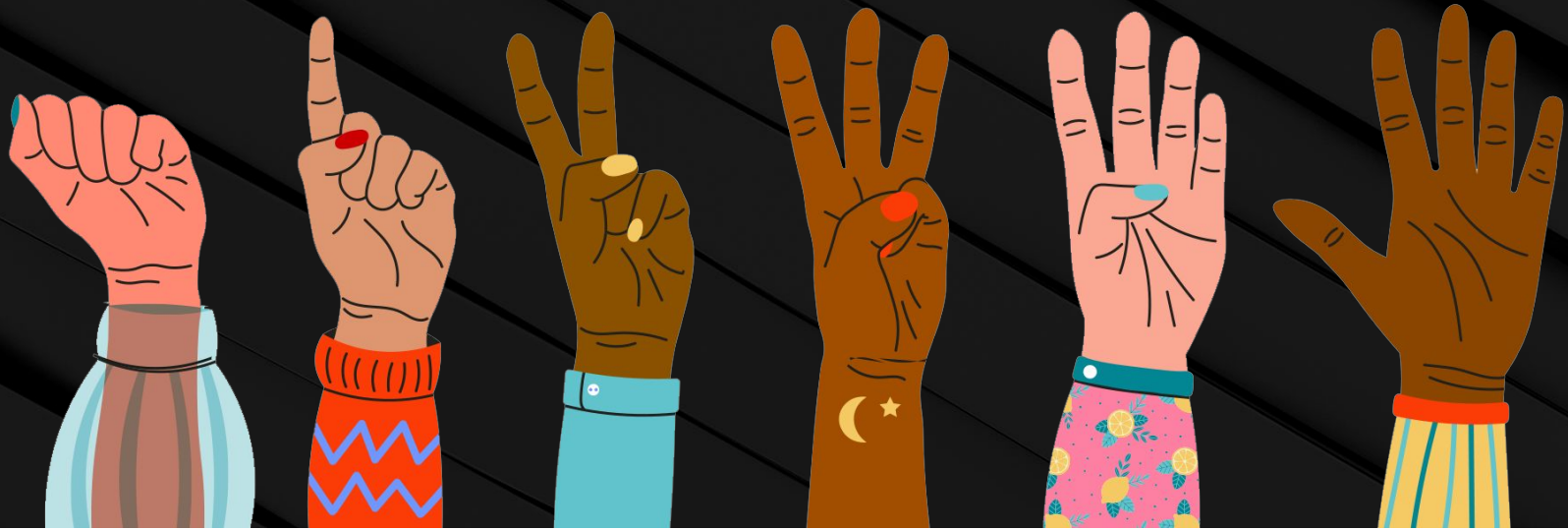
02 JavaScript functions and arrow functions

03 Repetition and conditional statements

Make sure you've downloaded any relevant class files!

FIST TO FIVE:

How comfortable do you feel with this topic?



Introduction to JavaScript

JavaScript

JavaScript fundamentals:

Arrays

Conditionals

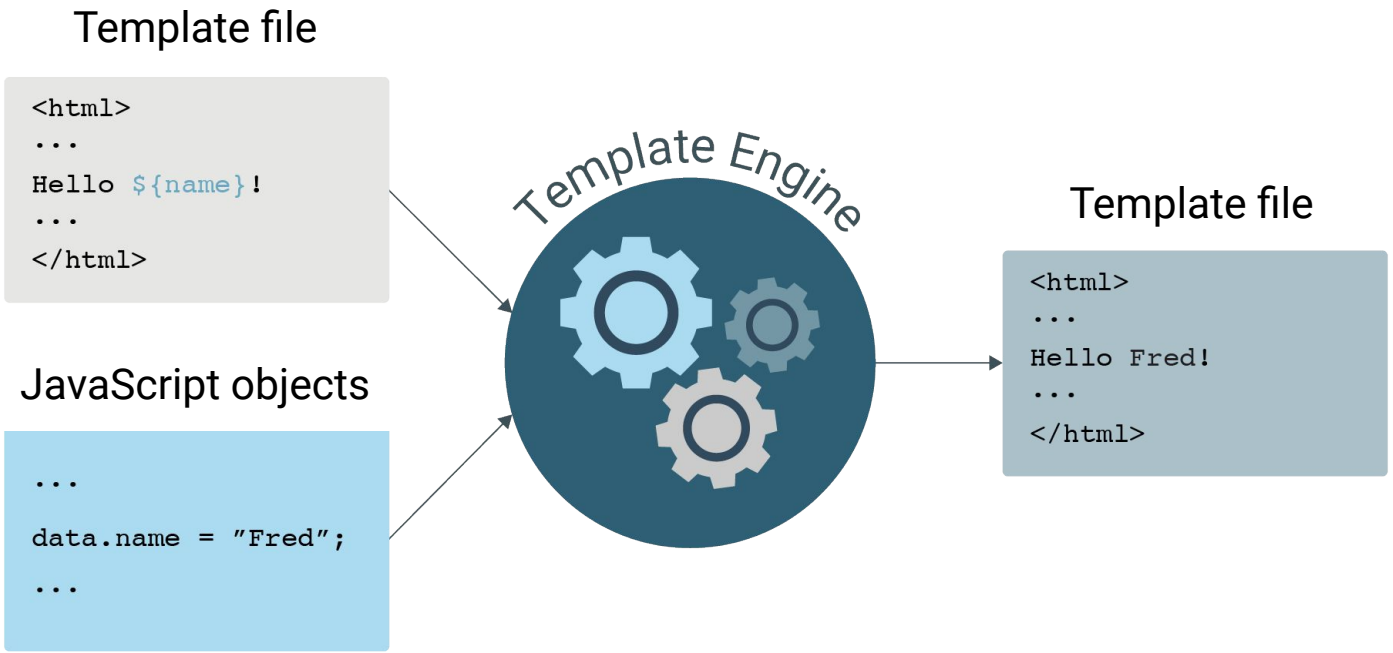
Loops

Functions

Objects

JavaScript

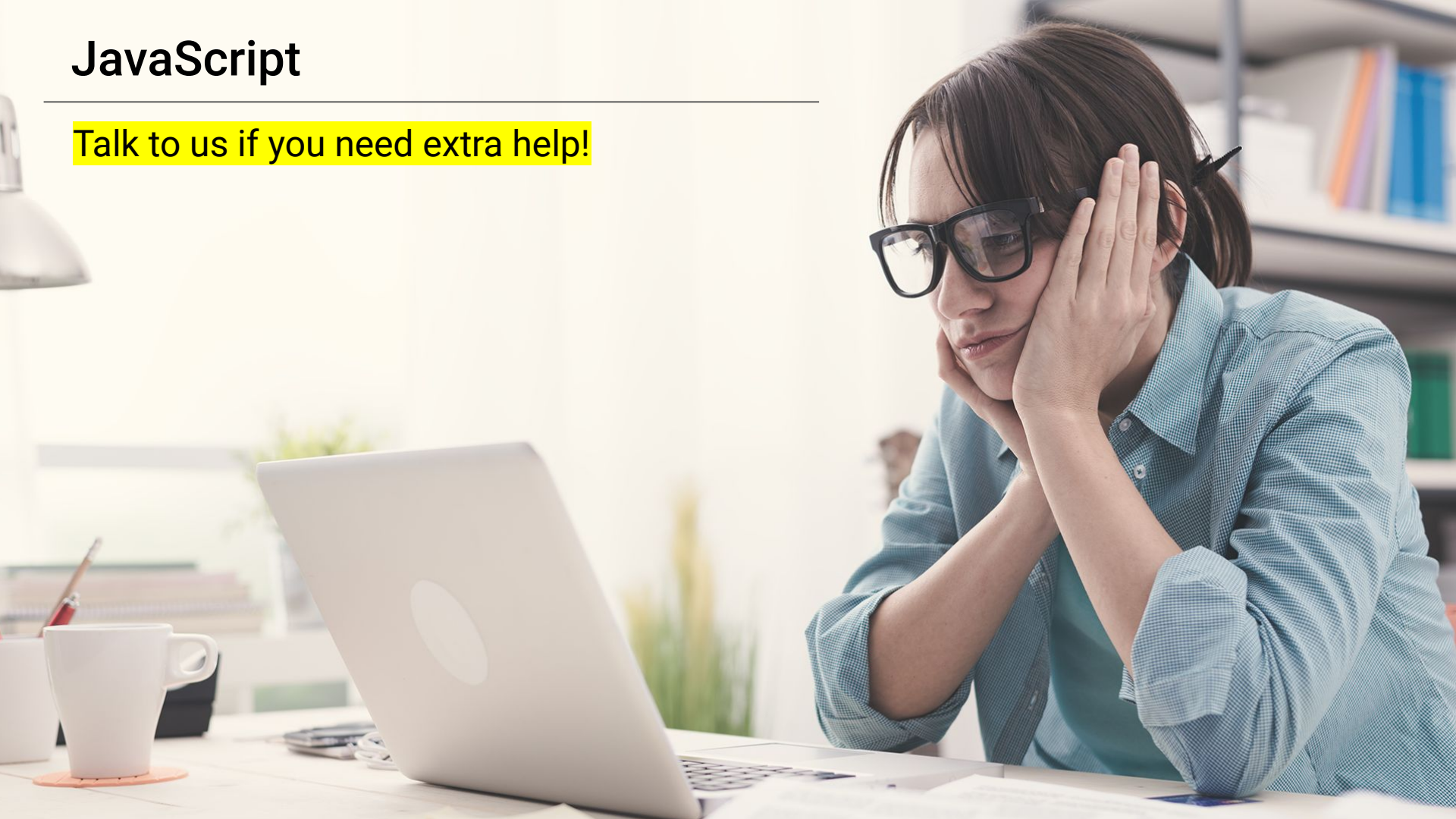
Just as important as the ability to crunch numbers is the ability to convey information to a wider audience, and JavaScript is the language of the web.



JavaScript makes it possible to create interactive web pages and visualizations.

JavaScript

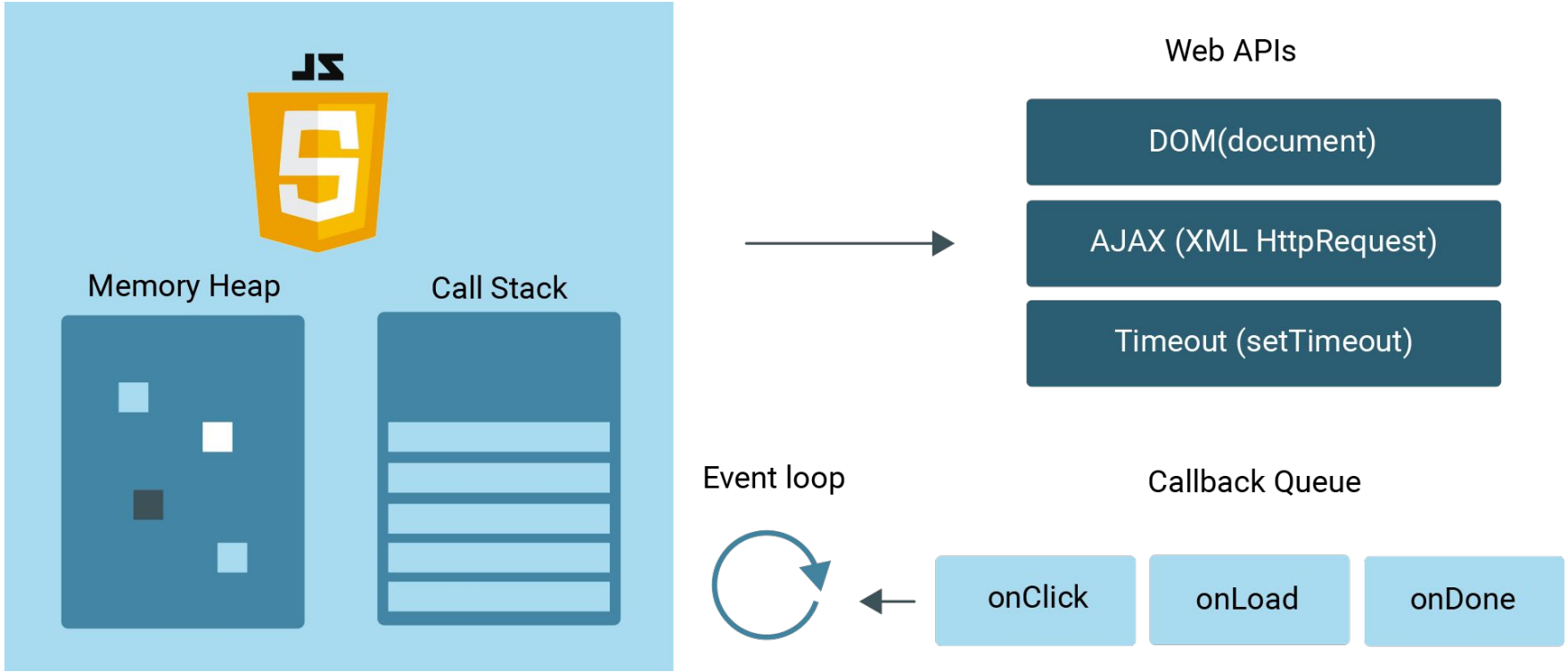
Talk to us if you need extra help!



JavaScript shares many similarities with Python, but there are also a number of differences, including typical usage and syntax.

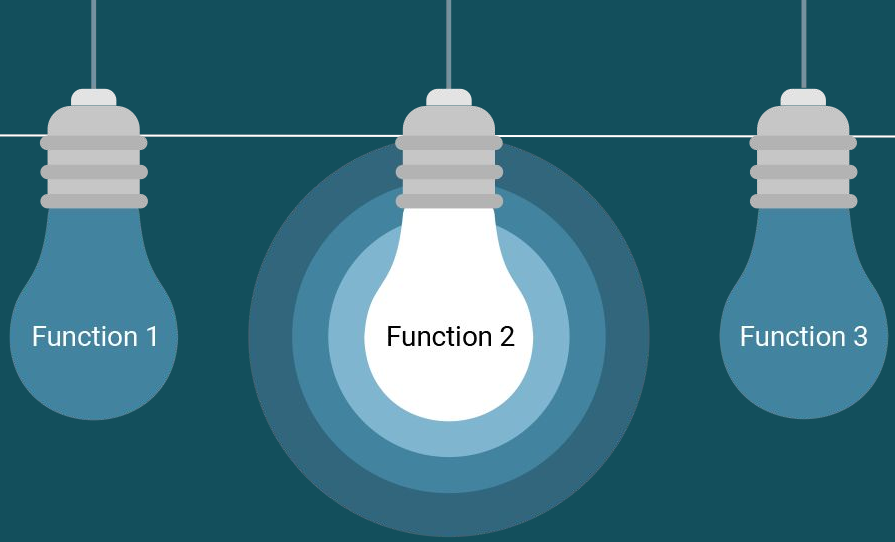
JavaScript

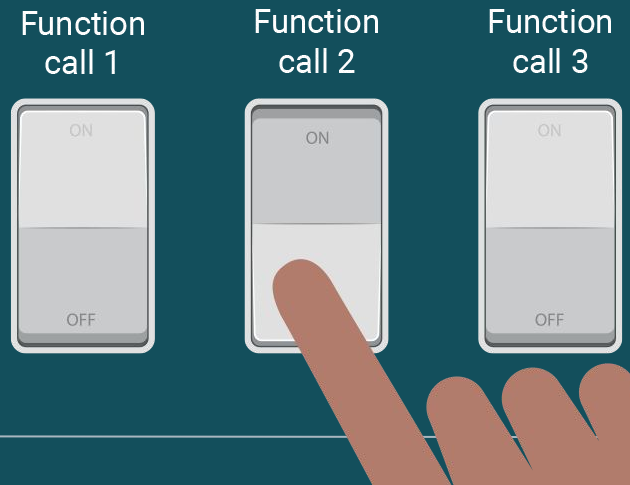
JavaScript is often used to place API calls to cloud data and services.



JavaScript

JavaScript also enables websites to send and receive data from a server, to respond to a user's actions on the page, and to dynamically modify HTML elements.

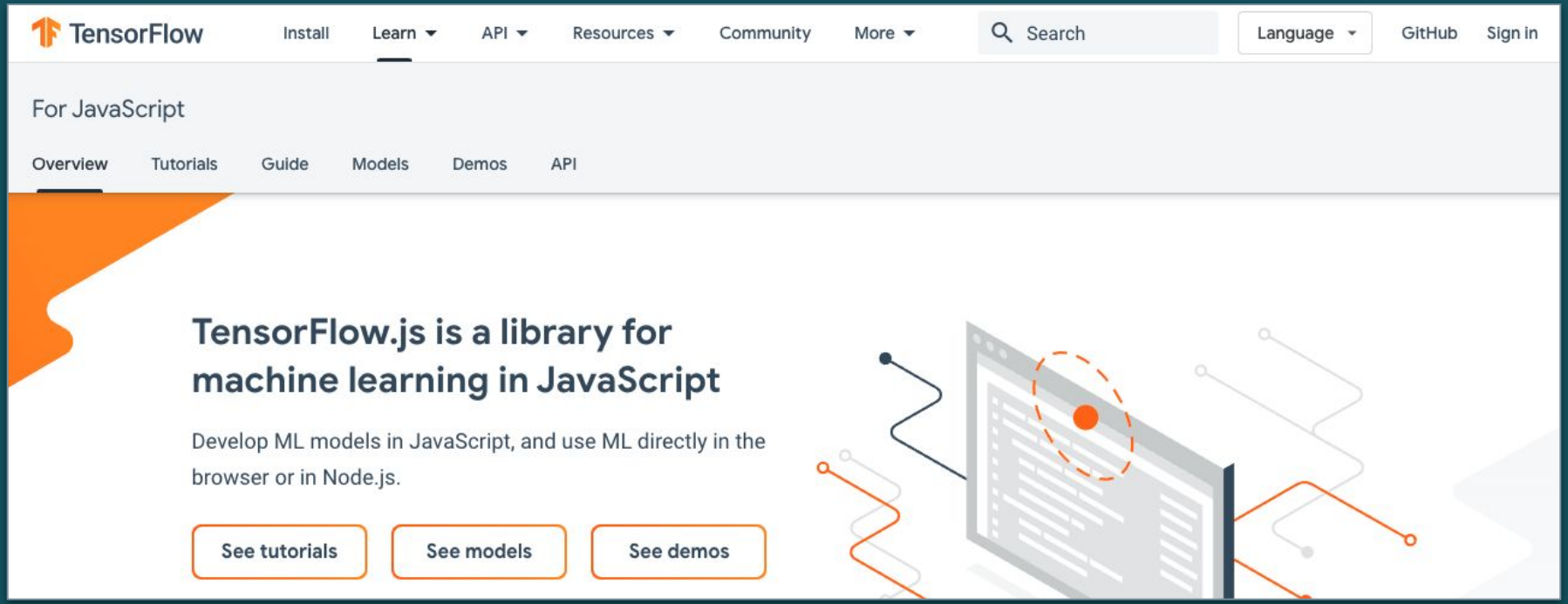




With JavaScript, it is possible to build interactive sites that do not require use of the command line interface

JavaScript

JavaScript is everywhere ...
Even machine learning has been made available for the web browser



JavaScript

JavaScript is a very marketable and in-demand skill for any data position.

How to Learn JavaScript

Your Brain on JavaScript

JavaScript

General Tips:

Review Immediately	We'll be building upon these concepts quickly. The firmer your grasp is now, the better off you'll be.
Redo the Class Exercises	Don't just reread! Actually spend the time to redo them from scratch on your own.
Get Help	Come to office hours. Ask conceptual questions. Ask specific questions. Just keep asking questions!
Don't Be Afraid	You will get this. It will take time, but you will get this. Just keep at it. Patience will pay off.

Instructor Demonstration

Running JavaScript

Running JavaScript

JavaScript is the language of the web, so its code is commonly found in HTML.

The code is placed between a pair of `script` tags.

The `console.log()` function prints out a message to a web browser's built-in console.


```
<!DOCTYPE html>
<html lang="en">

<head>
 <title></title>
 <meta charset="UTF-8">
 <meta name="viewport" content="width=device-width,
initial-scale=1">
</head>

<body>

 <h1>Open the Chrome Inspector Console!</h1>

 <script type="text/javascript">
   console.log("My script is stored within the HTML!")

 </script>

</body>

</html>
```

Running JavaScript

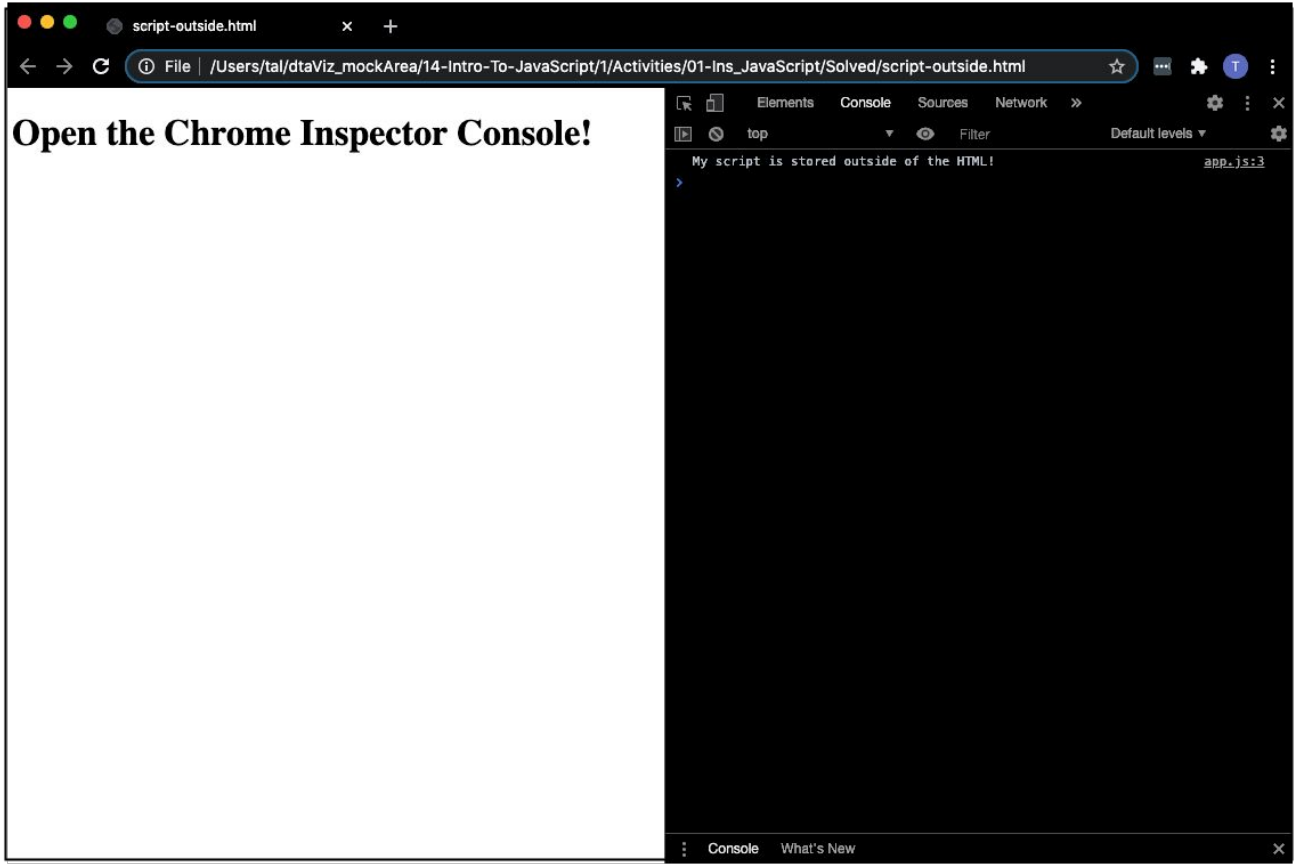
src="app.js"

```
<!DOCTYPE html>
<html lang="en">

<head>
 <title></title>
 <meta charset="UTF-8">
 <meta name="viewport" content="width=device-width, initial-scale=1">
</head>

<body>

 <h1>Open the Chrome Inspector Console!</h1>
 <!-- src contains the path to the file -->
 <script src="app.js"></script>
</body>

</html>
```

app.js

```
// This code will run when linked to in HTML
console.log("My script is stored outside of the HTML!")
```

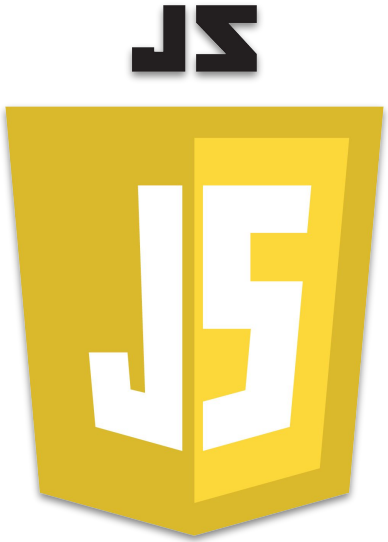
Running JavaScript



From Python to JavaScript

From Python to JavaScript

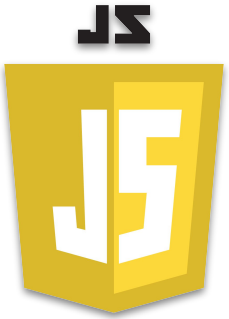
Python and JavaScript are logically and syntactically similar.



Variables

```
<variable Name> = <Value>
```

```
name = "Mad Max"
```



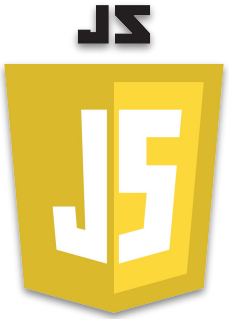
```
var <variable Name> = <Value>;
```

```
var name = "Mad Max";
```

Booleans

```
<variable Name> = True
```

```
satisfied = True
```



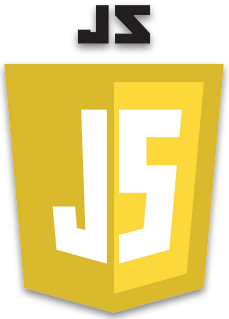
```
var <variable Name> = true;
```

```
var satisfied = true;
```

String template + Note:

```
# Python f-string
```

```
print(f"Hello, {name}!")
```



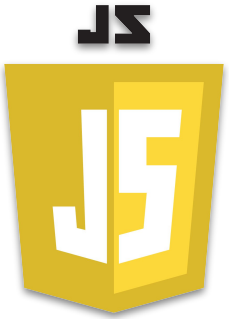
```
// JavaScript template literal
```

```
console.log(`Hello ${name}!`);
```

String Format Converted into Numeric Format

```
# int() function
```

```
weekly_wage = hourly_wage *
int(weekly_hours)
```



```
// parseInt() function
```

```
var weeklyWage = hourlyWage *
parseInt(weeklyHours);
```

From Python to JavaScript

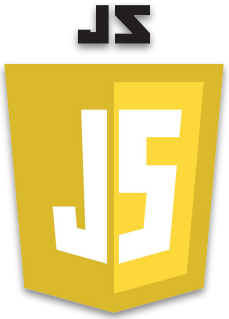
Suggested Time:

15 minutes

Conditionals with Comparison Operators (== vs ===)

```
# Use whitespace with indentation
```

```python
if x == 1:
    print("x is equal to 1")
```



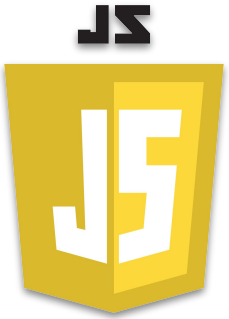
```
// Use curly brackets
```

```javascript
if (x === 1) {
  console.log("x is equal to 1");
}
```

Conditional with Logical Operators: and

```
# and
```

```
if x == 1 and y == 10:
    print("Both values returned true")
```



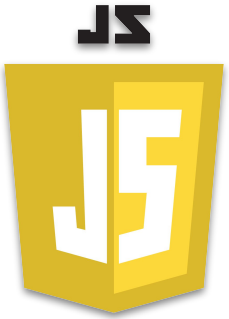
```
// &&
```

```
if (x === 1 && y === 10) {
 console.log("Both values returned true");
}
```

Conditional with Logical Operators: or

```
# or
```

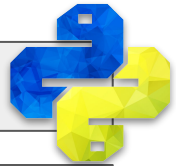
```
if x < 45 or y < 5:
   print("One or the other
statements were true")
```



```
// ||
```

```
if (x < 45 || y < 5) {
 console.log("One or the other
statements were true");
}
```

Nested Conditionals



```
# if...elif...else
```

```
if x < 10:
    if y < 5:
        print("x is less than 10 and
y is less than 5")
    elif y == 5:
        print("x is less than 10 and
y is equal to 5")
    else:
        print("x is less than 10 and
y is greater than 5")
```

```
// if...else if...else
```

```
if (y < 5) {
 console.log("x is less than 10 and
y is less than 5");
}
else if (y === 5) {
 console.log("x is less than 10 and
y is equal to 5");
}
else {
 console.log("x is less than 10 and
y is greater than 5");
}
```

Questions?

Instructor Demonstration

Variables, Arrays, and Objects

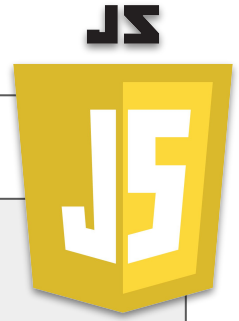
JavaScript Arrays

Suggested Time:

15 Minutes

JavaScript `arrays` are similar to Python `lists`.

JavaScript Arrays



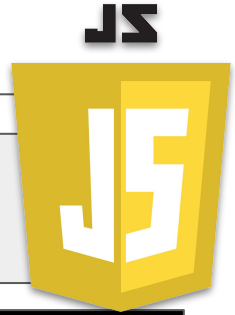
JavaScript array

```
var lettersArray =
["a", “b” , “c”, “d”];
```

index

```
var firstLetter =
lettersArray[0];
var secondLetter =
lettersArray[1];
a
b
```

JavaScript Arrays



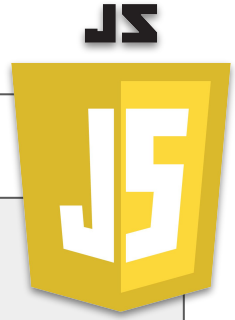
.push()

```
lettersArray.push("e");

var letterArray = ["a", “b” , “c”, “d”,
“e”];
```

.slice()

```
var slicedArray1 =
lettersArray.slice(1);
// Return the first three items of an
array
var slicedArray2 =
lettersArray.slice(0, 3);
// Return the second and third items of
an array
var sliced Array 3 =
lettersArray.slice(1, 3);
```

JavaScript Arrays



.join()

```
var joinedArray =
lettersArray.join(", ");
```

.split()

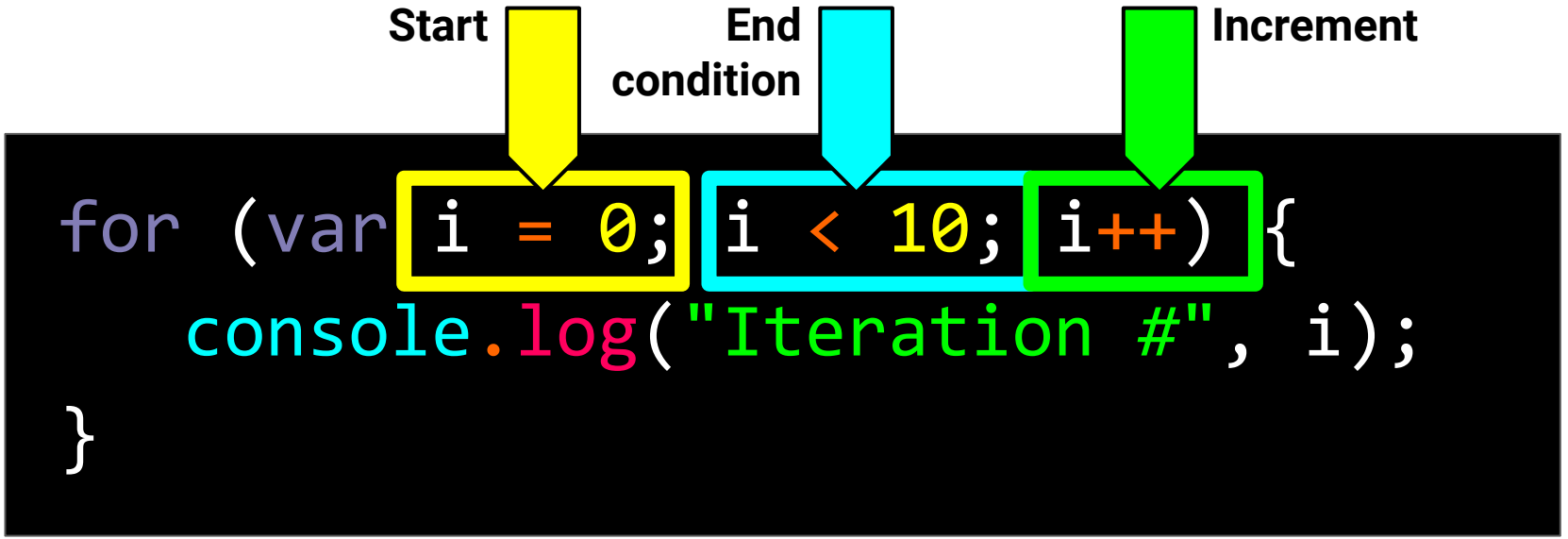
```
var soundArray =
soundOfMusic.split(" ");
```

Questions?

Instructor Demonstration

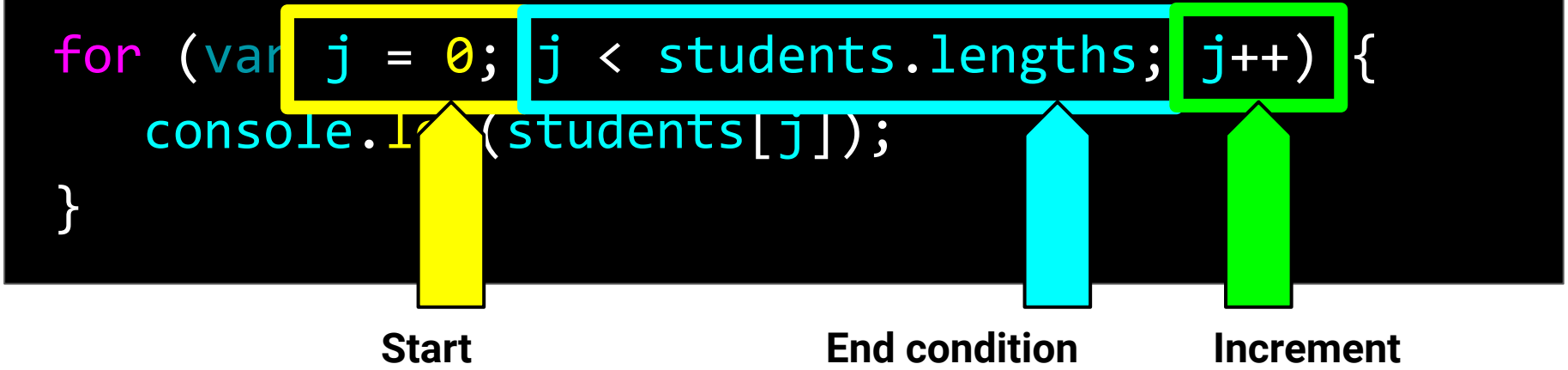
`for` Loops

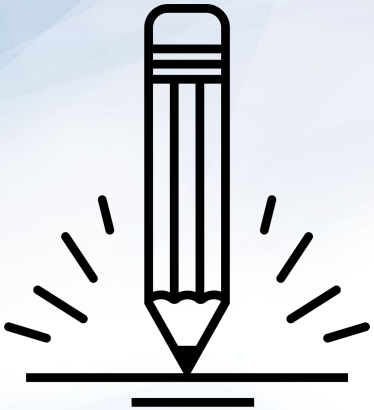
`for` Loops in JavaScript



for Loops on an Array in JavaScript

```
var students = ["Johnny", "Bodhi", "Pappas"];

for (var j = 0; j < students.lengths; j++) {
    console.log(students[j]);
}
```





Activity: Movie Scores

In this activity, you will use conditionals and loops to iterate through an array of movie scores and sort scores into new arrays by their values.

Suggested Time:
15 Minutes

Instructions: Movie Scores

- Given a list of movie scores, determine how many good, ok, and bad movies there were.
- Create a `for` loop to go through the `movieScore` list.
- Add scores over 7 to the `goodMovies` array.
- Add scores between 5 and 7 to the `okMovies` array.
- Add the rest of the scores to the the `badMovies` array.
- Also, calculate the average rating for all of the movies.
- Finally, print out how many good, ok, and bad movies there were, and what the overall total score was.

Hints:

- You will need to research how to push elements to an empty array.
- Check your Slack for the documentation to find the length of the array.

Let's Review

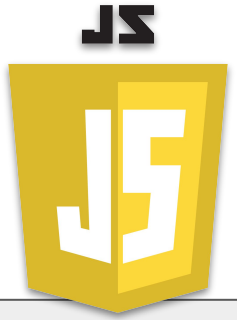
Instructor Demonstration

JavaScript Functions

Functions

```
def
```

```
def print_hello():
    print("Hello there!")
```



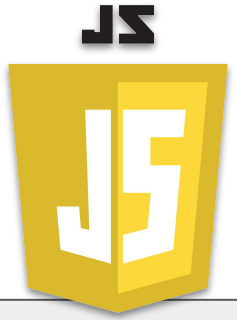
```
function
```

```
function printHello()
    console.log("Hello
there!");
}
```

Functions

```
def
```

```
print_hello()
addition(44, 50):
```



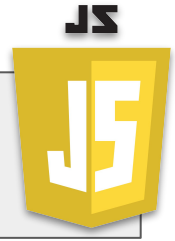
```
function
```

```
printHello();
console.log(addition(44, 50));
```

Functions

```
# Takes in a list and
loops through
```

```
def list_loop(user_list):
    for i in user_list:
        print(i)
```



```
// Accepts a parameter and
iterates through an array
```

```
function listLoop(userList) {
 for (var i = 0; i <
userList.length; i++) {
    console.log(userList[i]);
 }
}
var friends = ["Sarah", "Greg",
"Cindy", "Jeff"];
listLoop(friends);
```

Functions

```
# Uses previously declared
function
```

```
def double_addition(c, d):
    total = addition(c, d) * 2

    return total
```

```
// Functions can call
other functions
```

```
function doubleAddition(c, d) {
 var total = addition(c, d) * 2;

 return total;
}
// Log results of doubleAddition
function
console.log(doubleAddition(3, 4));
```

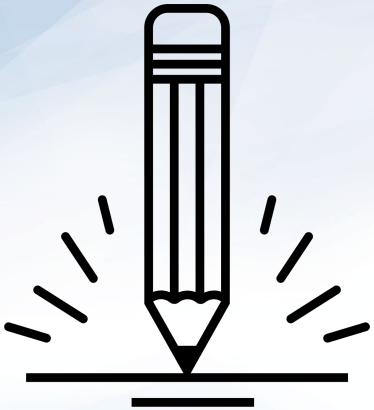
Functions

```
# Python built in function
for rounding
```

```
long_decimal = 112.34534454
rounded_decimal =
round(long_decimal)
print(rounded_decimal)
```

```
// JavaScript built
in functions
```

```
var longDecimal = 112.34534454;
var rounded Decimal =
Math.floor(longDecimal);
console.log(rounded Decimal);
```



Activity: Statistics Functions

In this activity, you will create functions that return statistical values from any given array of data.

Suggested Time:
15 Minutes

Instructions: Movie Score Statistics

01 Using the movie array from earlier as a starting point, create functions that will return statistical values from any given array of data.

02 Create functions that will find the following:

- Mean
- Variance
- Standard Deviation

03 Each function should `console.log` both the name of the statistic used and its value.
For example: "The Mean is: 33.3".

04 The functions should be able to take any array of numbers and return the statistical value.
After you have the functions working with movie data set, run them on the following additional data points:

```
monthlyAvgRainFall = [3.03, 2.48, 3.23, 3.15, 4.13, 3.23]
mileRunTimes = [5.06, 4.54, 5.56, 4.40, 7.10]
```

Hints:

Use the JavaScript Math library to handle calculations needing exponents or square roots.
Check your Slack to refresh on how to calculate variance and standard deviation.

Let's Review

Questions?