GENERAL ASSEMBLY

# JAVASCRIPT DEVELOPMENT

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# HELLO!

1. Pull changes from the `svodnik/JS-SF-7` repo to your computer
2. Open the `starter-code` folder in your code editor

# ASYNCHRONOUS JAVASCRIPT AND CALLBACKS

# LEARNING OBJECTIVES

At the end of this class, you will be able to

- Store and use anonymous functions in variables.
- Pass functions as arguments to functions that expect them.
- Write functions that take other functions as arguments.
- Return functions from functions.
- Instantly invoke functions with and without arguments.

# AGENDA

- jQuery Ajax
- Callbacks
- Immediately invoked function expressions (IIFEs)

# WEEKLY OVERVIEW

| | |
|---|---|
| **WEEK 7** | Asynchronous JS & callbacks / Advanced APIs |
| **WEEK 8** | Project 2 Lab / Prototypal inheritance |
| **WEEK 9** | `this` & Module pattern / CRUD & Firebase |

# HOMEWORK REVIEW

# Checkin and questions

- The **most significant thing I learned** about Ajax and APIs is _____.
- My **biggest outstanding question** about Ajax and APIs is _____.

# Brainstorm: What are the different ways we can create and store functions?

# Functions and callbacks

# ASYNCHRONOUS PROGRAMMING

- Code that relies on input or behavior that might not be instantly available
- We use asynchronous programming to run code at different times

# ANONYMOUS FUNCTIONS

```
var $yesButton = $('#yes-button');

$yesButton.on('click', function(event) {
  // do something
});
```

# FUNCTIONS ARE FIRST-CLASS OBJECTS

- Functions can be used in any part of the code that strings, arrays, or data of any other type can be used
- We can store functions as variables
- We can pass them as arguments to other functions
- We can return them from other functions
- We can run them without otherwise assigning them

# HIGHER-ORDER FUNCTION

- A function that takes another function as an argument, or that returns a function

# FUNCTION AS PARAMETER IN VANILLA JS

setTimeout()

```
setTimeout(function, delay);
```

# `setTimeout()`

- A JavaScript function that lets you specify a function to run after a delay (in milliseconds)

# setTimeout()

## syntax

```
setTimeout(function, delay);
```

## example

```
setTimeout(switchPage, 1000);
```

# FUNCTION AS PARAMETER IN VANILLA JS

setTimeout() with anonymous function as argument

```
setTimeout(function(){
  console.log("Hello world");
}, 1000);
```

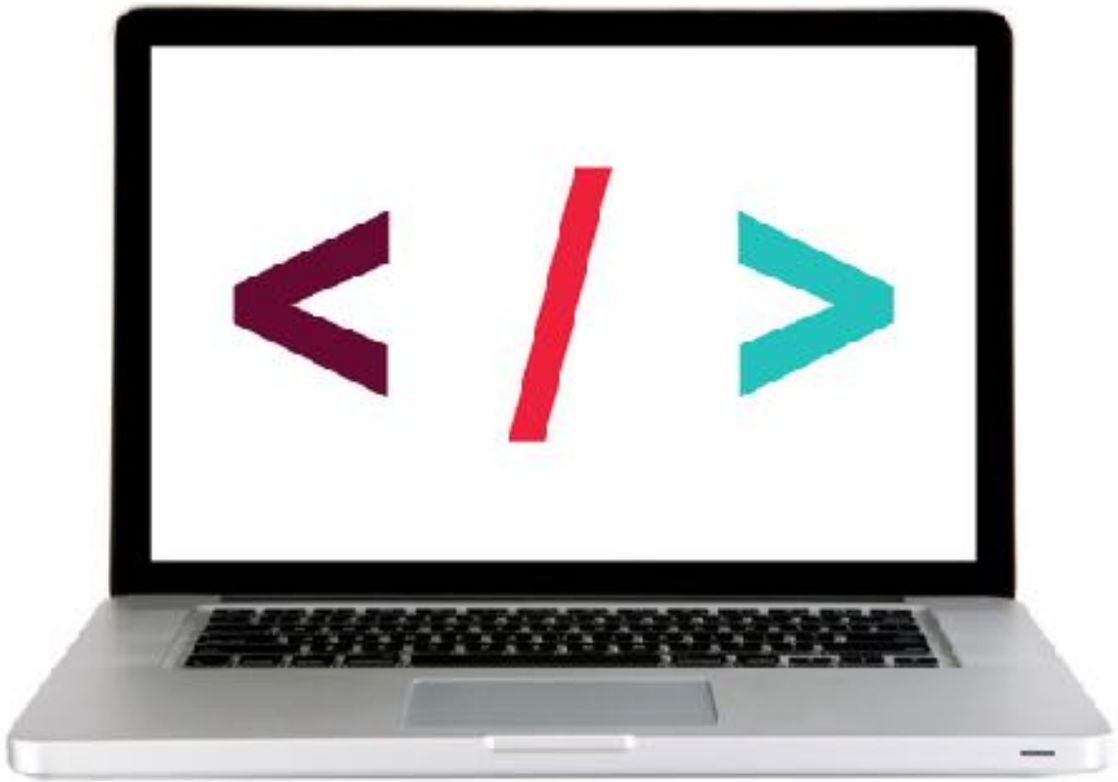
# FUNCTION AS PARAMETER IN VANILLA JS

setTimeout() with named function as argument

```
function helloWorld() {
  console.log("Hello world");
}

setTimeout(helloWorld, 1000);
```

# LET'S TAKE A CLOSER LOOK



# CALLBACK

- A function that is passed to another function as an argument, and that is then called from within the other function
- A callback function can be anonymous (as with `setTimeout()` or `forEach()`) or it can be a reference to a function defined elsewhere

# EVENT LISTENERS

- A way of specifying a function that should run in response to an event
- Performs the same function as specifying a value for a property like `onclick`
- The difference:
  - An event property (like `onclick`) can take only a single value (you can do only one thing in response) for any given element
  - But you can set multiple values (functions) to run in response to a single event listener

# EVENT LISTENER SYNTAX

```
element.addEventListener(“event”, function, false);
```

# EVENT LISTENER EXAMPLE

```
var nextButton = document.getElementById(“#next-button”);
nextButton.createEventListener(“click”, switchPage, false);
```

equivalent to

```
var nextButton = document.getElementById(“#next-button”);
nextButton.onclick = switchPage;
```

# EXERCISE - CREATING A CALLBACK FUNCTION


## LOCATION

▸ `starter-code > 1-callback-exercise`

## TIMING

*30 min*

1. In your editor, open main.js and read the instructions.
2. Fill in the starting code to create a function and predicate function that return the number of odd numbers in the array that's being passed in.
3. Test your work by opening index.html in your browser and opening the console. A working solution should log the value `4`.
4. BONUS: Create a second predicate function called `isEven()` that checks whether a number is even. Verify that it returns a value of `3` using the same array in the previous line.

# Immediately-invoked function expressions

# Immediately-invoked function expression (IIFE)

- A function expression that is executed as soon as it is declared
- Pronounced “iffy”
- Make a function expression into an IIFE by adding `()` to the end (before the semicolon)
- Make a function declaration into an IIFE by adding
  `(` at the start and
  `)()` to the end

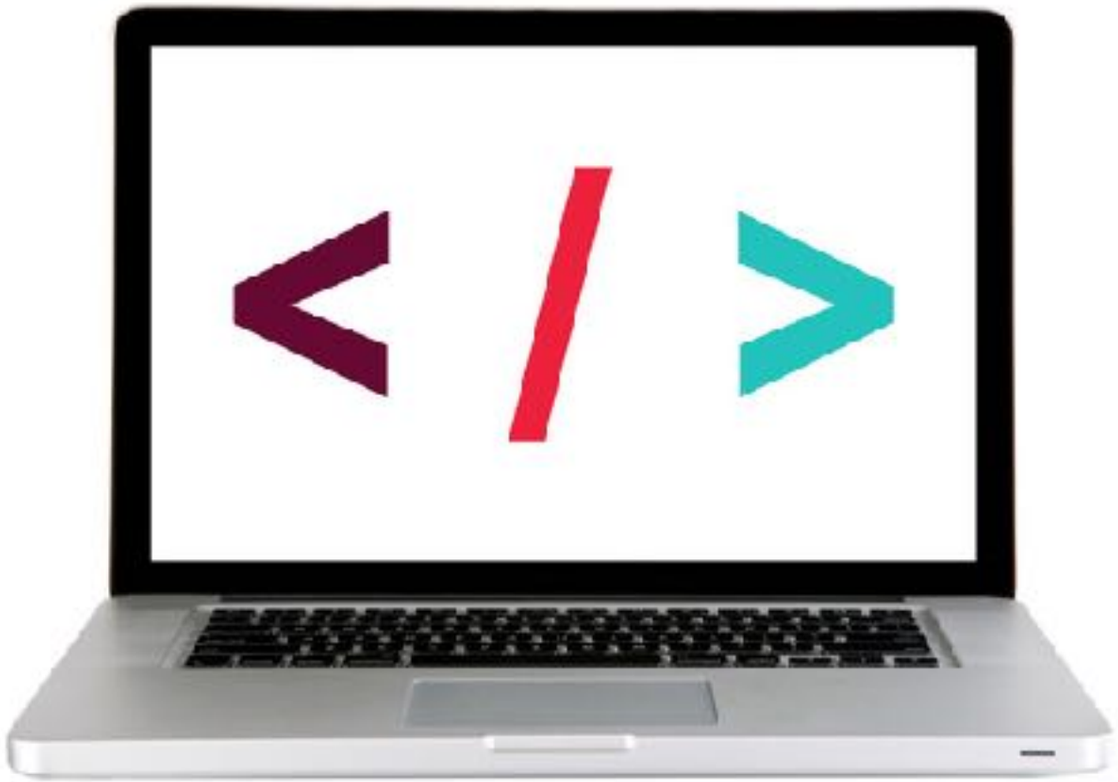
# IIFE based on a function expression

```
var countDown = function() {
  var counter;
  for(counter = 3; counter > 0; counter--) {
    console.log(counter);
  }
}();
```

# IIFE based on a function declaration

```
(function countDown() {
  var counter;
  for(counter = 3; counter > 0; counter--) {
    console.log(counter);
  }
})();
```

# LET'S TAKE A CLOSER LOOK



# EXERCISE - USING IIFES


## LOCATION

- `starter-code > 3-iife-exercise`

## TIMING

*until 9:15*

1. In your editor, open main.js and read the instructions.
2. Write an IIFE function that counts up to an end time in seconds that's passed as a parameter.
3. For each second that passes, the function should log the number of elapsed seconds to the console (1, then 2, then 3, etc.).
4. The function will automatically execute and count up every second until it reaches the specified parameter value.
5. Use the `setTimeout` function to count up. Hint: a second is the timer passed * 1000 (milliseconds).

# Callbacks and IIFEs in practice

- Callbacks are a best practice for handling interface updates based on user interactions and/or data from web services
- Callbacks and IIFEs let us better organize our code
  - module pattern
  - we'll learn about this in a couple weeks

# LEARNING OBJECTIVES - REVIEW

- Store and use anonymous functions in variables.
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# NEXT CLASS PREVIEW

## Advanced APIs

- Generate API specific events and request data from a web service.
- Implement a geolocation API to request a location.
- Process a third-party API response and share location data on your website.
- Make a request and ask another program or script to do something.
- Search documentation needed to make and customize third-party API requests.

# Exit Tickets!

# Q&A