Week 12
Interactive Design

Assignment 3

Objects

Loops

Document Object Model

Events

Assignment 3:

A Beautifully Designed Weather Web App

Project Brief

- The user must be able to search by city.

- Use all the skills you've accrued thus far. Images, animations, etc.

- Your design must be responsive.

- Your design should be engaging and interesting. This is it! Push yourself!

- **DUE 4/27**

JavaScript Objects

Objects in JS

- Group data in key/value pairs

- Can hold "properties" (variables) and "methods" (functions)

- Pretty much everything in JS is an Object.

Defining Objects and Retrieving Data

```javascript
// Define
var dog = {
  name: 'Margo',
  age: 6,
  speak: function () {
    console.log('WOOF')
  }
}
```

```javascript
// Call
dog.name // Margo
dog.speak() // WOOF
dog[age] // 6
```

Built-in Objects

JavaScript Objects

- String

- Number

- Boolean

- Date

- Math

- Regex

JS Object Examples

```js
var s = 'My String'
s.replace('my', 'your')


var pi = 3.141592653589793
pi.toPrecision(3)
Math.round(pi)


var today = new Date()
today.getFullYear()
```

Browser Objects

- Window

- Document

- History

- Location

- Navigator

- Screen

Browser Object Examples

```
window.innerHeight

location.assign('http://bu.edu')

screen.orientation

document.querySelector('.myClass')
```

Loops

About Loops

- A loop checks a condition and if it is true, repeats until the condition is false.

- Helpful for iterating over arrays and node lists.

- Three types: for, while, do while.

For Loop

```
for (var i = 0; i < myArray.length; i++) {
  console.log(myArray[i])
}
```

for...of

Loop over an Array!

```javascript
for (var item of myArray) {
  console.log(item)
}
```

for...in

Loop over an Object!

```javascript
for (var item in myObject) {
  console.log(myObject[item])
}
```

Manipulating Web Pages with JavaScript

Document Object Model (DOM)

- How the browser understands a web page.

- It is what you see in the elements tab in the browser's inspector.

- Each branch on the tree is called a "node."

Select Elements

Description

```javascript
// Select a single element
var myEl = document.querySelector('.myClass')


// Select a group of elements to loop over!
var myEls = document.querySelectorAll('.myClass')
```

Changing Elements

```
myElem.style.background = 'yellow'
myElem.classList.add('newClass')
myElem.textContent = 'OH HAI!'
myElem.innerHtml = '<p>Hello!</p>'
```

Events

What's an Event?

- A JavaScript Object!

- When someone is on your site, the browser is constantly telling you what they're doing.

- You can "listen" for different events.

- When you the browser tells you about an event, you can "handle" it.

Types of Events

- Browser Events

- User Interface Events

- DOM Events

- Form Events

Window Events

```
scroll

resize

load

unload

error
```

Mouse Events

```
click

dblclick

mousedown

mouseup

mousemove

mouseover

mouseout
```

Keyboard Events

```
keydown

keyup

keypress
```

CSS Animation Events

```
animationstart

animationend

animationiteration

transitionend
```

How to Handle Events

```javascript
// Step 1: Select an Element
var myEl = document.querySelector('.myClass')

// Step 2: Tell the browser what event to listen for
// and how to handle it
myEl.addEventListener('click', myFunction)

// Step 3: Handle the event with a function
function myFunction (event) {
  // Do something here.
}
```

The Event Object

- Gives you a ton of information!

- Most importantly the type of event and the target of the event.

Event Properties

```
function myFunction (event) {
  console.log(event.target)
  console.log(event.type)
}
```

Prevent Default Behavior

Sometimes we need to override the default behavior of a link or a form.

```
function myFunction (event) {
    event.preventDefault()
}
```

JavaScript Challenges

- Log a message to the console when a button is clicked.

- Change the color and size of a <h1> element with JavaScript.

- Create an Array and write each value to the screen.