Module 4 Day 6

Intro to JavaScript

Some Quick Facts

JavaScript is an ***interpreted*** scripting language that ***runs on internet browsers***.

- JavaScript is not related to Java except that it shares a similar syntax. Do not confuse them in interview conversations. It is also not the same as JScript.
- It originated in Netscape's LiveScript until a clever marketing campaign with Sun turned it into JavaScript in late 2015 (This all goes back to the Browser Wars mentioned last week).
- In recent times, JavaScript libraries and frameworks have seen regular incremental extensions in the last 5 years.

The Three Pillars of The World Wide Web

- **HTML**: The ***content*** being presented.
- **CSS**: How that content is ***format***ted.
- **JavaScript**: Any actions or ***behavior***s the content can provide.

JavaScript: Adding it to an HTML page

JavaScript can be incorporated directly into a HTML page...

```
<html>
<head>
     <script>
          window.alert('Hello World.');
     </script>
</head>
<body>Helpful Content.</body>
</html>
```

… with the block of JavaScript code enclosed in a set of <script></script> tags.

JavaScript: The Preferred Method

It is recommended that JavaScript logic be placed in a separate file and “included” in the HTML file using a src attribute just like we see in <link> and <img> tags.

index.html

```
<html>
<head>
<script src="script.js"></script>
</head>
<body>Helpful Content.</body>
</html>
```

script.js

```
window.alert('Hello World.')
```

This is the preferred method. The <script> tag may be placed in the <head> or <body>. However, placing them at the bottom of the <body> is preferred for performance. YMMV

Loosely Typed

- In terms of data types, JavaScript is loosely typed, meaning we do not explicitly tell JavaScript what data type a variable will hold.

- These are the data types a variable can take on: **String**, **Number**, **Boolean**, **Array**, and **Object**.

- The type of the variables is ***inferred*** during processing based on content.

Declaring Variables

- Declaring variables in JavaScript takes on the following form:

  let <<variable name>> = <<initial value>>;

```
let myStrVariable = 'hammer';
let myNumVariable = 3;
let myOtherNumVariable = 3.14
let myBoolean = true;
```

- In older texts you will see variables declared using var, i.e. var myBoolean = true. This should be avoided at all costs, **always use let**. ... (for now)
- Values that do not change are declared using **const**.

Inspecting the Inferred Type: typeof

- We can use typeof to ascertain the data type of a variable.

```
let myStrVariable = 'hammer';
console.log(typeof myStrVariable); // string
let myNumVariable = 3;
console.log(typeof myNumVariable); // number
let myOtherNumVariable = 3.14
console.log(typeof myNumVariable); // number
let myBoolean = true;
console.log(typeof myBoolean); // boolean
```

Declaring An Array

Here are a few examples of array declarations:

```
//Declaring an array with three strings:
let myArray = ['Fiat Chrysler', 'Ford', 'GM'];

//An empty array:
let myEmptyArray = [];
```

Iterating Through an Array

Our loopy friends are back:

```
let myArray = ['Fiat Chrysler', 'Ford', 'GM'];
for (i=0; i < myArray.length; i++) {

   console.log(myArray[i]);
}
// Prints out Fiat Chrysler Ford GM
```

- Note that the for-loop is structurally similar to its Java counterpart.
- We access individual elements of an array in a similar way: myArray[0] for the first, myArray[1] for the second, etc.
- We can access the length of an array with the .length property.

Conditional Statements and Comparisons

These should also look familiar:

```
let x = -3;
let positive = (x > 0);
console.log(positive);
// Prints false

if (x <0) {
   console.log(x + ' is a negative number.');
}
// Prints -3 is a negative number
```

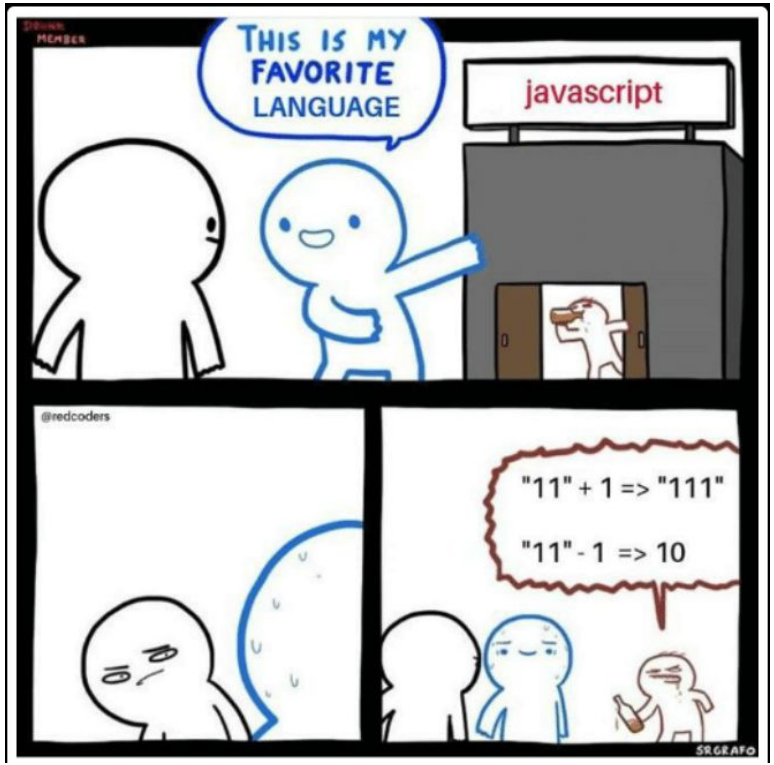
Conditional Statements and Comparisons

We can also apply AND / OR / XOR statements:

```
let x = -3;
let y = -4
let positive = (x > 0);

if (x <0 && y <0) {
   console.log('Both numbers are negative.');
}
else if ( x < 0 ^ y < 0) {
   console.log('Only one is negative.');
}
else {
   console.log('Both are positive');
}
```

Truthy and Falsy



If you are coming from a strictly typed language like Java, there are some unusual things to consider with regards to data type, one of these is the idea of “truthy” and “falsy.”

Truthy and Falsy

- These rules can sometimes strike one as bizarre, but we can derive an intuitive understanding of what's going on. Here is a good site with a more in-depth explanation:
  https://developer.mozilla.org/en-US/docs/Web/JavaScript/Equality_comparisons_and_sameness
- For now, consider the following code:

```
let i ='1';
let j = 1
console.log(i == j); // true
console.log(i === j); // false
```

- The triple equals is to evaluate "strict equality" - meaning that not only do the values have to be the same, but the types must equal as well.

Objects

- JavaScript is not generally considered an object oriented language, it is instead a functional language (one that is based on functions).
  - Over time though, some OO features have been added to the language.

- Luckily, JavaScript objects follow JSON notation, with the object itself surrounded by curly braces, and the object properties listed in comma delimited key-value pairs:

  { **prop1**: **<<prop1Value>>**, **prop2**: **<<prop2Value>>**}

Objects Example

Let’s look at a concrete example:

```
let crewMember = {
firstName: 'James',
lastName: 'Kirk',
rank: 'Captain'
};

console.log(crewMember.firstName);
console.log(crewMember.lastName);
console.log(crewMember.rank);
crewMember.rank = 'Admiral';
console.log(crewMember.rank);
```

Let’s Code!