MPT Web Design

Week 3: Introduction to Javascript

What will we do in this class?

Extend the functionality of our webpages!

We will look at the basics of JavaScript

- Syntax
- DOM Model
- What it can do
- Why we would we use it

Javascript

MPT Week 2 CSS

A basic HTML layout to use in future

Section Header

Lorem ipsum dolor sit amet, consectetur adipiscing elit, sed do eiusmod tempor incididunt ut labore et dolore magna aliqua. Ut enim ad minim veniam, quis nostrud exercitation ullamco laboris nisi ut aliquip ex ea commodo consequat. Duis aute irure dolor in reprehenderit in voluptate velit esse cillum dolore eu fugiat nulla pariatur. Excepteur sint occaecat cupidatat non proident, sunt in culpa qui officia deserunt mollit anim id est laborum

Posted by: Me

Second Section

Ut enim ad minim veniam, quis nostrud exercitation ullamco laboris nisi ut aliquip ex ea commodo consequat. Duis aute irure dolor in reprehenderit in voluptate velit esse cillum dolore eu fugiat nulla pariatur. Excepteur sint occaecat cupidatat non proident, sunt in culpa qui officia deserunt mollit anim id est laborum

Posted by: Someone Else

Second Section

Ut enim ad minim veniam, quis nostrud exercitation ullamco laboris nisi ut aliquip ex ea commodo consequat. Duis aute irure dolor in reprehenderit in voluptate velit esse cillum dolore eu fugiat nulla pariatur. Excepteur sint occaecat cupidatat non proident, sunt in culpa qui officia deserunt mollit anim id est laborum

Posted by: Someone Else

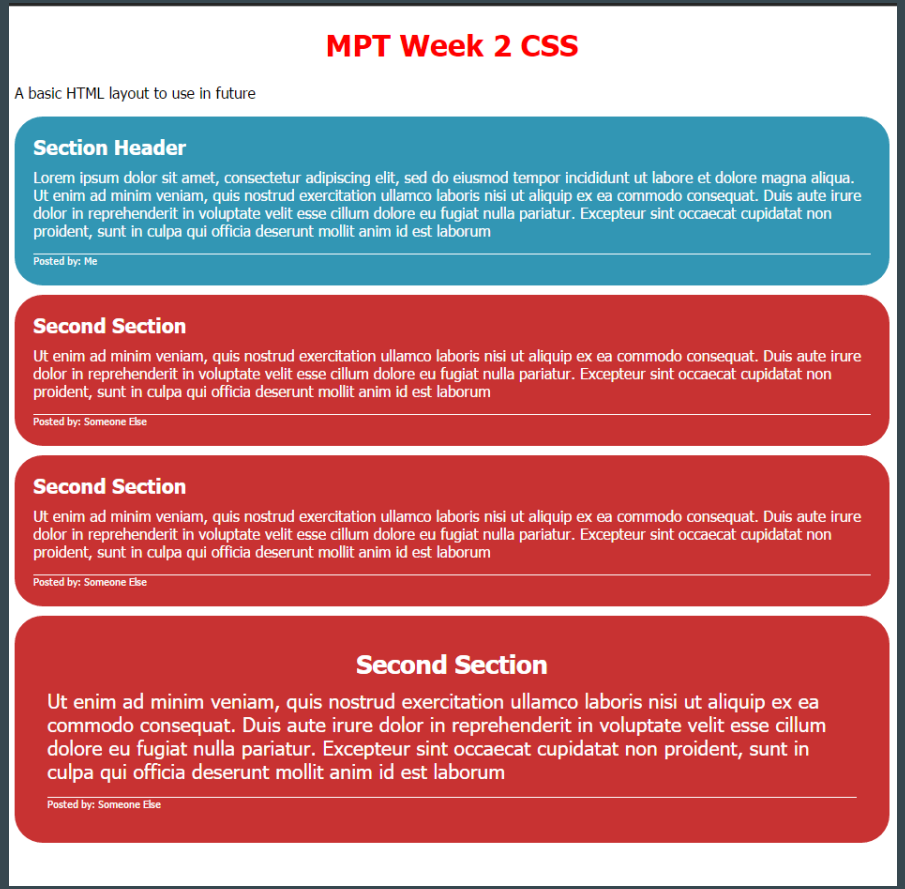
Second Section

Ut enim ad minim veniam, quis nostrud exercitation ullamco laboris nisi ut aliquip ex ea commodo consequat. Duis aute irure dolor in reprehenderit in voluptate velit esse cillum dolore eu fugiat nulla pariatur. Excepteur sint occaecat cupidatat non proident, sunt in culpa qui officia deserunt mollit anim id est laborum

Posted by: Someone Else

Questions to Ask

- Is there any UI elements?
- Can the user change the look of the page? Such as colour, font, hide/show elements.
- Or change HTML attributes?
- Can the user input a value and have a simple action performed on it?
- Can the user change the content on the web page?

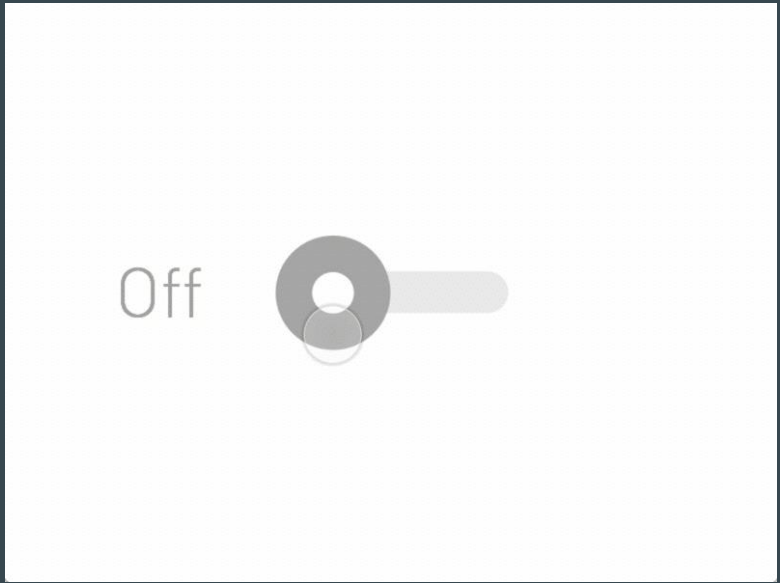


Short Answer

No

Long Answer

Our web pages so far have not had any UI elements and did not allow for any sort of interactivity.



We will use JavaScript to extend this functionality

Where CAN we write our JavaScript?

Basically anywhere on the page, as long as there's a good reason and depending on the context

```html
<!DOCTYPE html>

<html lang="en">

    <head>
      <meta charset="utf-8">

      <title>Page Title</title>
      <meta name="description" content="A basic HTML template to use">
      <meta name="author" content="Aaron Bolger">

      <script type="text/javascript">
                alert("Hello From JavaScript");
      </script>

    </head>

    <body>
        <!-- Comments look like this -->
        <h1>HTML Template</h1>
        <p>A basic HTML layout to use for future sites</p>
    </body>
```

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

    <head>
      <meta charset="utf-8">

      <title>Page Title</title>
      <meta name="description" content="A basic HTML template to use">
      <meta name="author" content="Aaron Bolger">

      <script type="text/javascript" src="my/file/path.js"></script>

    </head>

    <body>
        <!-- Comments look like this -->
        <h1>HTML Template</h1>
        <p>A basic HTML layout to use for future sites</p>
    </body>

</html>
```

Where DO we write our JavaScript?

In the head of web page in `<script>` tags

```html
<!DOCTYPE html>

<html lang="en">

    <head>
      <meta charset="utf-8">

      <title>Page Title</title>
      <meta name="description" content="A basic HTML template to use">
      <meta name="author" content="Aaron Bolger">

      <script type="text/javascript">
                alert("Hello From JavaScript");
      </script>

    </head>

    <body>
        <!-- Comments look like this -->
        <h1>HTML Template</h1>
        <p>A basic HTML layout to use for future sites</p>
    </body>
```

Or in an external file which we link to using `<script>` tag. (similar to CSS)

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

    <head>
      <meta charset="utf-8">

      <title>Page Title</title>
      <meta name="description" content="A basic HTML template to use">
      <meta name="author" content="Aaron Bolger">

      <script type="text/javascript" src="my/file/path.js"></script>

    </head>

    <body>
        <!-- Comments look like this -->
        <h1>HTML Template</h1>
        <p>A basic HTML layout to use for future sites</p>
    </body>

</html>
```

What do we already know from Python?

Variables

Data Types

Int, String, Float, Array

Functions

Operators

+ - = < > * /

If / else Conditionals

For Loops

While Loops

What's Different in JavaScript?

Keyword `function`

Columns and indents *aren't required* - indents are still useful

Function code needs to be in curly braces {}

```
function myFunc() { code; }
```

All lines must end with a semicolon ;

Keyword `var` for declaring variables

```
var myInt = 0;
```

Golden Rules

Brought to you by
Sabin Tabirca

JavaScript Syntax

```javascript
// comment
/*
    Block Comment
*/

function myFunction(val1, val2){
    // add vals
    var val3 = val1 + val2;
    alert(val3);
}
```

For Loop if/else Example

```
var myVar = false;
var Things = [];

if (myVar == true) {
    //do something
    alert("true");
}
else{
    // do something
    alert("false");
}



for (var i = Things.length - 1; i >= 0; i--) {
    Things[i]
};
```

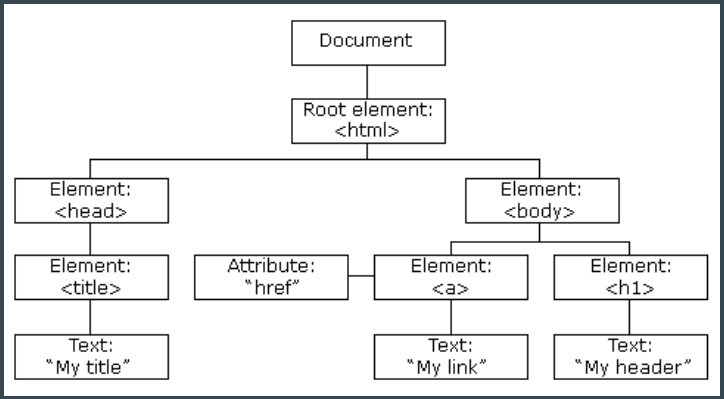
DOM Model

We need to use the DOM Model (Document Object Model) to access elements (tags)

To use the DOM we use the following bit of code: document.getElementBy... e.g.

```
document.getElementById()

document.getElementsByClass()
```



DOM Example

HTML

```html
<body>
    <!-- Comments look like this -->
    <h1>HTML Template</h1>
    <p>A basic HTML layout to use for future sites</p>

    <div id="demo" >
        Hello HTML
    </div>
</body>
```

JavaScript

```javascript
document.getElementById("demo").innerHTML = "Hello JavaScript";
```

Note the use of `id`

`div id=”demo”` and `document.getElementById(“demo”)`

Note the use of `.innerHTML`

How do we trigger/call our functions?: Events

HTML events are "things" that happen to HTML elements.

Events can be caused by the user or by the browser. JavaScript can "react" on the occurrence of these events.

Event	Description
`onchange`	An HTML element (usually input) has been changed
`onclick`	The user clicks an HTML element
`onmouseover`	The user moves the mouse over an HTML element
`onmouseout`	The user moves the mouse away from an HTML element
`onkeydown`	The user pushes a keyboard key
`onload`	The browser has finished loading the page

Event Example

HTML

```html
<body>
    <!-- Comments look like this -->
    <h1>HTML Template</h1>
    <p>A basic HTML layout to use for future sites</p>

    <div id="demo" >
        Hello HTML
    </div>
    <button onclick="changeText();">Change Text</button>

</body>
```

JavaScript

```javascript
function changeText(){
    // make reference to DOM and update innerHTML with new String
    document.getElementById("demo").innerHTML = "Hello JavaScript";
}
```

Resources

W3Schools JavaScript Introduction: http://www.w3schools.com/js/js_intro.asp

Events in JavaScript: http://www.w3schools.com/js/js_events.asp

DOM: http://www.w3schools.com/js/js_htmldom.asp