Lecture 5

JavaScript

* Slide background spider web photograph from Morguefile openstock photograph by Gabor Karpati, Hungary.
Client-side Dynamic HTML

- Definition by behavior
  - HTML Document Changes Client-Side.
    - In response to user.
    - Automatically, for example animation.

- Definition by example – Mix
  - Client side scripting, e.g. JavaScript
  - Page elements are object, e.g. DOM
  - Properties of objects, e.g. CSS
Document Object Model

There is a lot going on here!

Appropriate for this course:
- Common elements on a page,
- Including the page itself,
- Are objects to which actions may be attached.
Do not confuse Java and JavaScript.
Learning JavaScript. Where to start.
Learn by example:
- Textbook
- The web
We will not be going too deep.
Mind security/convenience tradeoff.
Here are examples that go with Lecture 5, an introduction to JavaScript. Prior to 2017 these examples came in the second half of the semester, following the presentation of PHP. The examples still use PHP for common elements. Glance at this code but otherwise ignore it for now.

Keep in mind that some of these examples are dated. I am maintaining them because the simplistic stylistic conventions that make them dated also help bring to the surface some of the underlying mechanics of JavaScript. In particular, how JavaScript relates to the Object Model (DOM) that are hidden by more modern techniques; most notably jQuery.

- Example 1: Using document dot write to create a Hello World example.
- Example 2: Document properties, variables, strings and the connection to CSS id's.
- Example 3: On mouse over events play ping pong with Thing 1 and 2.
- Example 4: Functions, conditionals and getting in touch with inner HTML.
- Example 5: Form selections and the on change event for navigation.
- Example 6: Simple button to navigate - see the Cow.
- Example 7: Image rollovers and beyond - switching images based upon mouse position.

Here is a file you may download with the actual php content: lec05.zip
Hello World

You may write to the document.

```html
<div id="contents">
  <p>
    This is about the simplest JavaScript example possible.
    View the source to see what is going on.
  </p>
  <script type="text/javascript">
    document.write("<p>Hello World</p>");
  </script>
  <noscript>
    <p>Your browser doesn't support or has disabled JavaScript.</p>
  </noscript>
</div>

<!-- end of the page contents -->
```
This is about the simplest JavaScript example possible. View the source to see what is going on.

Hello World
Example 1 - Observations

- The script tag has ‘type’ attribute.
  - Language attribute is deprecated.
- Note the use of `<noscript>` tags.
  - Arguably less important now, but ...
- No accounting for older browsers.
- First taste of document object model.
  - The document object has method ‘write’.
Example 2

- Using CSS id’s to name objects.
- Accessing properties of objects.
- Assignment to variables.
- String concatenation.

```html
16  <p><a id="catfish" href="http://en.wikipedia.org/wiki/Catfish">Learn more about Catfish.</a></p>
17  </a>
18  
19  </p>
20  <script>
21     myurl = document.links.catfish.href
22     document.write('The URL is ' + myurl)
23  </script>
24  </p>
```
Example 2 – The Page

The printed URL is pulled from link.

This page illustrates JavaScript variables, document properties, the relationship between CSS id's and document properties, and finally string concatenation.

Oh, and it also is useful if you want to learn more about catfish.

[Learn more about Catfish.](http://en.wikipedia.org/wiki/Catfish)

Example 3 – Functions

- Usually in header or separate file.
- Definition syntax pretty standard.

```php
<?php
$exNumText = '03a';
include 'ct310phpexStart.php';
?>
<script>
function goThere() {
    document.location.href = "ct310lec16ex03b.php";
}
</script>
</head>
<?php include 'ct310phpexHeader.php';?>
<div id="contents">
```
First Taste of Power

- What is document.location.href?
- It is the URL of the current window.
- It can be used to retrieve a URL.
- In our example it is on the left side of an assignment statement.
  - ... think about this ...
- That is enough to switch the page!
- Fun, but not generally a good idea.
Example 3 - Events

- JavaScript is about exploiting events.
- Many events involve the mouse.
- For example, a click (up or down).
- Or, simply passing over an object.

```html
12  <div id="contents">
13  
14  <p>Welcome to the home of Thing 1.</p>
15  
16  <img src="ex03thing1.png" width=232 height=215 />
17  
18  <form action="#">
19      <input type="button" value="Thing 2 is just as good." onmouseover="goThere()"/>
20  </form>
```
Example 3 – The Page

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Welcome to the home of Thing 1.

May small things remind us of Theodor Seuss Geisel's many talents.
Example 3 – The Page

Welcome to the home of Thing 2.

May small things remind us of Theodor Seuss Geisel's many talents.
Example 4 – More Functions

- Conditionals, recursion and return.
- Get in touch with ‘innerHTML’ 😊

```html
5<br>
6    function fact(n) {
7        if (n < 2) { return(1); }  
8        else { return(n * fact(n-1)); }  
9    }
10   function showResult() {
11       nn = parseInt(document.enter.num.value);
12       nc = "The factorial of " + nn + " is " + fact(nn);
13       document.getElementById("result").innerHTML = nc;
14    }
15</script>
```
Example 4 – Make it Go

What makes this page do something?
Think about object’s ‘enter’ and ‘num’.
Assignment to ‘innerHTML’ is powerful.

```
function showResult() {
    nn = parseInt(document.getElementById('num').value);
    nc = "The factorial of " + nn + " is " + fact(nn);
    document.getElementById("result").innerHTML = nc;
}
```

```
<form name="enter">
    <input type="text" value="9" name="num" onchange="showResult()" />
</form>
<p id="result">Factorial will appear here when you enter a number above.</p>
```
Example 5 – Navigation

Notice how the URL passes to goSite().

```html
<script>
function goSite(sel) {
    window.location.href = sel.options[sel.selectedIndex].value;
}
</script>

Where do you want to go next?

<form action="#">
<select name="sample" onchange="goSite(this)" size="1">
    <option selected="selected" value="#">Choose Your Destination</option>
    <option value="http://www.yahoo.com">Yahoo!</option>
    <option value="http://www.google.com">Google</option>
</select>
</form>
```
Example 5 – The Page

This page illustrated event handling in a form selection object, and in particular the `onchange` event. It also provides another example of how navigation can send a user to a new web page with very little action on their part.

Where do you want to go next?

Choose Your Destination
Example 6 - Buttons

Here is a simpler example where a button is used to create a link to a new page opening in a new window.

Dawn M Turner's image from morguefile.
Example 6 – Window.open

```html
13  <button type="button"
14       onclick="window.open('ex06cowPage.html','fuzzy','top=200,left=200')">
15       See a Cow!
16  </button>
```

Using the window.open method

The syntax of the window.open method is given below:

```
open (URL, windowName[, windowFeatures])
```

**URL**
The URL of the page to open in the new window. This argument could be blank.

**windowName**
A name to be given to the new window. The name can be used to refer this window again.

**windowFeatures**
A string that determines the various window features to be included in the popup window (like status bar, address bar etc)
Example 7 – Rollover

➟ Change the image based upon mouse.

This example shows one way of associating the appearance of different images with how a user positions the mouse on a page. This is both a means of building image rollovers and more sophisticated interactions with a user. This example is based upon one developed by Terry Ann Morris.

http://localhost/~ross/ct310/yr20...ogress/aplay/lec16/ex07roses.html
Example 7 - Header

Note the variables and image objects.

```javascript
if (document.images) {
  placeholder = new Image
  image1on = new Image
  image2on = new Image
  placeholder.src = "ex07blank.jpg"
  image1on.src = "ex07roseon.jpg"
  image2on.src = "ex07daisyon.jpg"
}

function showMe(myImage) {
  if (document.images)
    document.display.src = eval(myImage + ".src")
}
```
Example 7 – The Table

- Note that ‘display’ is the name of an image object on the page.
- Two types of mouse events.

```html
<table border="0">
<tr>
  <td rowspan="2"><img src="ex07blank.jpg" name="display" id="display" width="109" height="54" alt="flower" /></td>
  <td><a href="ex07roses.html" onmouseover="showMe('image1on')"
    onmouseout="showMe('placeholder')">Roses</a></td>
</tr>
<tr>
  <td><a href="ex07daisies.html" onmouseover="showMe('image2on')"
    onmouseout="showMe('placeholder')">Daisies</a></td>
</tr>
</table>
```