Chapter 12.5: jQuery

CS 80: Internet Programming

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jQuery

- A lightweight javascript library
- Main advantage: provides a lot of functionality in a minimal amount of code
  - Works across browsers and platforms
  - Means you don't have to worry about minor differences between browsers
- Makes practical javascript much easier

Importing jQuery

- jQuery is hosted by many large companies

```
1  <!-- import your own local jQuery -->
2  <script src="jquery-3.1.0.min.js"></script>
3  <!-- import Google's hosting of jQuery -->
4  <script src="https://ajax.googleapis.com/ajax/libs/jquery/3.1.0/
       jquery.min.js"></script>
```

jQuery Basics

- Conceptual starting points
  - We will *select* HTML elements and then perform some *action* on the elements
  - Basic syntax:

```
1  $(selector).action()
```

  - $ indicates we are using jQuery
  - (selector) finds corresponding HTML elements
  - action() performs some action on the elements

Anonymous Functions

- Anonymous functions are functions without a name

- We had subtly been using anonymous functions when we assigned variables to functions

- Remember:

```
1  // javascript anonymous function declaration
2  var sum2 = function(a,b){
3    return a + b;
4  }
```

Anonymous Functions

- Remember:

```
1  // javascript anonymous function declaration
2  var sum2 = function(a,b){
3    return a + b;
4  }
```

- The right hand side of this assignment has no name!

- We'll be seeing this pattern more, don't freak out!

Document Loading

- Previously, we used the following paradigm to wait until the page is ready:

```
1  // wait for document to load to run the start function
2  window.addEventListener("load", start, false);
3
4  function start(){
5    // startup code
6  }
```

- jQuery makes this a lot easier…

```
1  // equivalent to adding an event listener for when document is
     loaded
2  $( document ).ready(function() {
3    // startup code
4  }); //notice the syntax of this, we are passing an anonymous
     function as a parameter! (see the ");" ending the parameter
```

Document Loading

- What does this do?
  - `$(document)` Selects the document
  - `.ready()` is a a jQuery event
  - The anonymous function is the callback to call when the event is trigger
  - Notice how similar this is to what we did before, but with much simpler code
    * We didn't have to register a listener for the page loading, then define another function for the start of the DOM interaction.
    * jQuery does this in one step!

jQuery Selectors

- `*` - select all
- `#id` - select id `id`
- `.class` - select CSS class **class**
- `ele` - select all HTML `ele` elements
- You can also use comma separated values to select multiple selectors
  - E.g. `.class1,.class2` will select both `.class1` and `.class2`
- See: http://www.w3schools.com/jquery/jquery_ref_selectors.asp

Old Example: `loading_event_listeners.html`

```
1  <!DOCTYPE html>
2  <html>
3
4  <head>
5    <meta charset=utf-8 />
6    <title>Proper Loading</title>
7    <script>
8
9      function start(){
10       document.getElementById("p1").addEventListener("mouseenter",
             addHighlight);
11       document.getElementById("p1").addEventListener("mouseleave",
             removeHighlight);
12     }
13
14     document.addEventListener("DOMContentLoaded", start);
15
```

```
16      // the following line will not work! DOM is not loaded (yet)
17      //start();
18
19      function addHighlight() {
20        var p1 = document.getElementById("p1");
21        p1.setAttribute("style", "background-color: #3F6");
22      }
23
24      function removeHighlight() {
25        var p1 = document.getElementById("p1");
26        p1.removeAttribute("style");
27      }
28    </script>
29  </head>
30
31  <body>
32    <p id="p1">
33      Lorem ipsum dolor sit amet, consectetur adipiscing elit. Quisque
           faucibus augue in risus tempus viverra. Etiam gravida augue a
           venenatis sollicitudin. Praesent varius ex varius, accumsan
           libero vel, bibendum eros. Aenean tristique mattis sem id
           scelerisque. In cursus ultrices massa nec tristique. Phasellus
           efficitur ac neque eu suscipit. Donec volutpat pretium justo,
           eget fringilla sapien. Integer vitae metus eget lorem auctor
           vestibulum non ut risus. Aenean hendrerit iaculis sapien. Nunc
           vestibulum purus quam, nec consequat sem cursus a. Aenean
           interdum euismod dui id dapibus. Curabitur vel placerat purus.
           Etiam dolor turpis, dictum in augue sit amet, suscipit suscipit
           leo. Aliquam auctor fringilla ligula, vitae sodales ligula
           facilisis quis. Donec consequat molestie tempus. Donec faucibus
           elit ullamcorper ante accumsan congue.
34    </p>
35  </body>
36
37 </html>
```

Exercise

- How can we achieve the same with jQuery?
- Hint: you have the `.mouseenter()`, `.mouseleave()`, `.attr()`, and `.removeAttr()` jQuery actions

Example: `highlighting_mouse.html`

```
1   <!DOCTYPE html>
2   <html>
3
4   <head>
5     <meta charset=utf-8 />
6     <title>Proper Loading</title>
7     <script src="https://ajax.googleapis.com/ajax/libs/jquery/3.1.0/
          jquery.min.js"></script>
8     <script>
9
10    $(document).ready(function(){
11      $("#p1").mouseenter(addHighlight);
12      $("#p1").mouseleave(removeStyle);
13    });
14
15    function addHighlight(){
16      $("#p1").attr("style", "background-color: #3F6");
17    }
18
19    function removeStyle(){
20      $("#p1").removeAttr("style");
21    }
22
23    </script>
24  </head>
25
26  <body>
27    <p id="p1">
28      Lorem ipsum dolor sit amet, consectetur adipiscing elit. Quisque
          faucibus augue in risus tempus viverra. Etiam gravida augue a
          venenatis sollicitudin. Praesent varius ex varius, accumsan
          libero vel, bibendum eros. Aenean tristique mattis sem id
          scelerisque. In cursus ultrices massa nec tristique. Phasellus
          efficitur ac neque eu suscipit. Donec volutpat pretium justo,
          eget fringilla sapien. Integer vitae metus eget lorem auctor
          vestibulum non ut risus. Aenean hendrerit iaculis sapien. Nunc
          vestibulum purus quam, nec consequat sem cursus a. Aenean
          interdum euismod dui id dapibus. Curabitur vel placerat purus.
          Etiam dolor turpis, dictum in augue sit amet, suscipit suscipit
          leo. Aliquam auctor fringilla ligula, vitae sodales ligula
          facilisis quis. Donec consequat molestie tempus. Donec faucibus
```

```
            elit ullamcorper ante accumsan congue.
29    </p>
30  </body>
31
32  </html>
```

Exercise

- How would we do this with anonymous functions?

Example: `highlighting_mouse_anon.html`

```
1   <!DOCTYPE html>
2   <html>
3
4   <head>
5     <meta charset=utf-8 />
6     <title>Proper Loading</title>
7     <script src="https://ajax.googleapis.com/ajax/libs/jquery/3.1.0/
          jquery.min.js"></script>
8     <script>
9
10    $(document).ready(function(){
11      $("#p1").mouseenter(function(){
12        $("#p1").attr("style", "background-color: #3F6");
13      });
14      $("#p1").mouseleave(function(){
15        $("#p1").removeAttr("style");
16      });
17
18    });
19    </script>
20  </head>
21
22  <body>
23    <p id="p1">
24      Lorem ipsum dolor sit amet, consectetur adipiscing elit. Quisque
          faucibus augue in risus tempus viverra. Etiam gravida augue a
          venenatis sollicitudin. Praesent varius ex varius, accumsan
          libero vel, bibendum eros. Aenean tristique mattis sem id
          scelerisque. In cursus ultrices massa nec tristique. Phasellus
```

```
            efficitur ac neque eu suscipit. Donec volutpat pretium justo,
            eget fringilla sapien. Integer vitae metus eget lorem auctor
            vestibulum non ut risus. Aenean hendrerit iaculis sapien. Nunc
            vestibulum purus quam, nec consequat sem cursus a. Aenean
            interdum euismod dui id dapibus. Curabitur vel placerat purus.
            Etiam dolor turpis, dictum in augue sit amet, suscipit suscipit
            leo. Aliquam auctor fringilla ligula, vitae sodales ligula
            facilisis quis. Donec consequat molestie tempus. Donec faucibus
            elit ullamcorper ante accumsan congue.
25    </p>
26  </body>
27
28  </html>
```

Exercise

- But this is not very resuable
- Why?

Exercise

- But this is not very resuable
- Why?
    - We can't make #p1 a variable!
    - And cannot easily highlight other IDs
- Fix?

Example: `highlighting_mouse_anon_func.html`

```
1   <!DOCTYPE html>
2   <html>
3
4   <head>
5     <meta charset=utf-8 />
6     <title>Proper Loading</title>
7     <script src="https://ajax.googleapis.com/ajax/libs/jquery/3.1.0/
          jquery.min.js"></script>
8     <script>
9
10      $(document).ready(function(){
```

```
11      highlightOnMouseEnter("#p1");
12      highlightOnMouseEnter("#p2");
13    });
14
15    function highlightOnMouseEnter(selector){
16      $(selector).mouseenter(function(){
17        $(selector).attr("style", "background-color: #3F6");
18      });
19      $(selector).mouseleave(function(){
20        $(selector).removeAttr("style");
21      });
22    };
23    </script>
24  </head>
25
26  <body>
27    <p id="p1">
28      Lorem ipsum dolor sit amet, consectetur adipiscing elit. Quisque
          faucibus augue in risus tempus viverra. Etiam gravida augue a
          venenatis sollicitudin. Praesent varius ex varius, accumsan
          libero vel, bibendum eros. Aenean tristique mattis sem id
          scelerisque. In cursus ultrices massa nec tristique. Phasellus
          efficitur ac neque eu suscipit. Donec volutpat pretium justo,
          eget fringilla sapien. Integer vitae metus eget lorem auctor
          vestibulum non ut risus. Aenean hendrerit iaculis sapien. Nunc
          vestibulum purus quam, nec consequat sem cursus a. Aenean
          interdum euismod dui id dapibus. Curabitur vel placerat purus.
          Etiam dolor turpis, dictum in augue sit amet, suscipit suscipit
          leo. Aliquam auctor fringilla ligula, vitae sodales ligula
          facilisis quis. Donec consequat molestie tempus. Donec faucibus
          elit ullamcorper ante accumsan congue.
29    </p>
30    <p id="p2">
31      Lorem ipsum dolor sit amet, consectetur adipiscing elit. Quisque
          faucibus augue in risus tempus viverra. Etiam gravida augue a
          venenatis sollicitudin. Praesent varius ex varius, accumsan
          libero vel, bibendum eros. Aenean tristique mattis sem id
          scelerisque. In cursus ultrices massa nec tristique. Phasellus
          efficitur ac neque eu suscipit. Donec volutpat pretium justo,
          eget fringilla sapien. Integer vitae metus eget lorem auctor
          vestibulum non ut risus. Aenean hendrerit iaculis sapien. Nunc
          vestibulum purus quam, nec consequat sem cursus a. Aenean
          interdum euismod dui id dapibus. Curabitur vel placerat purus.
```

```
             Etiam dolor turpis, dictum in augue sit amet, suscipit suscipit
             leo. Aliquam auctor fringilla ligula, vitae sodales ligula
             facilisis quis. Donec consequat molestie tempus. Donec faucibus
             elit ullamcorper ante accumsan congue.
32    </p>
33  </body>
34
35  </html>
```

Example: `highlighting_mouse_anon_func.html`

- This is a good example of how to modularize and expand a simple example into a reusable segment of code

jQuery Animation

- jQuery can animate CSS property changes!

- The property changes must be numerical (e.g. cannot animate `background-color: red`)

- The properties are contained in a set of curly braces like so (this data format is called JSON, which we will cover later):

```
1  { css-prop1: value, css-prop2: value }
```

Exercise

- Write an animation to change a box's hieght and width to 300px when the user's mouse enters the box. The box should start at 100px by 100px and return to that size when the mouse leaves

Example: `animation.html`

```
1  <!DOCTYPE html>
2  <html>
3
4  <head>
5    <!-- use google's hosting of jQuery -->
6    <script src="https://ajax.googleapis.com/ajax/libs/jquery/3.1.1/
         jquery.min.js"></script>
7    <!-- write our own jQuery code using the script above -->
```

```
8    <script>
9      $(document).ready(function() {
10       $("#box").mouseenter(function() {
11         $("#box").animate({
12           height: "300px",
13           width: "300px"
14         });
15       });
16       $("#box").mouseleave(function() {
17         $("#box").animate({
18           height: "100px",
19           width: "100px"
20         });
21       });
22     });
23   </script>
24 </head>
25
26 <body>
27   <div id="box" style="background:#98bf21; height:100px; width:100px;
        margin:6px;"></div>
28 </body>
29
30 </html>
```