Announcements

- PS 6 will be ready this evening or tomorrow morning
- Try to get help from me and tutors
- Reading assignment for this slide set:
  - JavaScript tutorial: http://www.w3schools.com/js/default.asp
- Break around 10:15am
JavaScript

- One of 3 languages for all web developers **must** learn:
  - **HTML** to define the content of web pages
  - **CSS** to specify the layout of web pages
  - **JavaScript** to program the behavior of web pages (on client side)

- Is a scripting (programming) language with
  - dynamic typing and
  - first-class functions

- Used as part of a web browser
  - Handles static content
  - cf. for dynamic content, we will use Python later
JavaScript (cont.)

- Allows client-side scripts to
  - interact with the user
  - control the browser
  - alter the document content that is displayed
  - cf. server-side scripting will be done using Python later

- JavaScript files are named with .js extension, e.g., demo.js

- Not related to the programming language Java at all although it shares the same name
What you need

- A text editor for writing JavaScript code, e.g., Sublime Text 2
- A web browser, e.g., Chrome, Firefox, IE, Safari
- Opening a JavaScript interpreter on Chrome or Firefox
  - OSX: Command+Option+i
  - Windows: F12 or Ctrl+Shift+i
  - Alternatively, you can right click anywhere on any web page and choose “Inspect Element”
- To type commands that span multiple lines, use Shift+Enter
Some basic concepts

- An *element* in HTML is any tagged item in the page, e.g., `<b>…</b>`, `<h3>…</h3>`, `<table>…</table>`, etc.

- `document` is the HTML DOM (Document Object Model) object that represents a web page
  - It is the owner of all other objects in your web page

- Finding HTML elements: If you want to access objects in an HTML page, you start with the `document` object, e.g.,
  - `document.getElementById()` to find an element by an element id

- Changing HTML elements, e.g.,
  - `element.innerHTML = …` to change the inner HTML of an element
  - `element.attribute = …` to change the attribute of an HTML element
  - etc.
Embedding JavaScript in HTML

- Use `<script> … </script>` tag
  - cf. We used `<style>…</style>` for CSS

- Two ways of embedding:
  - `<script>…</script>` tag can be embedded in an HTML page
    - See `js1.html` for an example

  - `<script>…</script>` tag can be separated into a separate file
    - See `js5.html` for an example after you study `forms.html`
Replacing an element (next)

- Use `document.getElementById("aaa").innerHTML` for some id `aaa`

- Use a `<button>…</button>` tag with an `onclick` event that is handled by a JavaScript function that acts as an event handler
  - See `js1.html` for an example

- `<script>…</script>` tag can be used to separate JavaScript code into a separate file
  - See `bmi.html` and `bmi.js` after you study `js4.html`
Changing attributes of an element

- Use `document.getElementById("aaa").innerHTML` for some id `aaa`.

- See `js2.html`, `pic_bulbon.gif`, `pic_bulboff.gif` for an example:
  - Note how the `src` attribute of an `img` element is changed in `changelmage` function.
  - See how `match` function works (google “match in JavaScript” for doc).
  - Note also that JavaScript is a programming language:
    - It uses functions, variables, conditionals (if … else), etc.
Changing style of an element

- See js3.html

- See how the fontSize and color of the style attribute of an element are modified in changeStyle function
Validating input data

- See js4.html

- In js4.html see how the input tag, button tag, and validateInput function are working together
Separating js code into another file

- See `bmi.html` and `bmi.js`

- Note how `type` and `src` are used inside the `script` tag

- Also see how a `form` is created with a `name` specified as `bmi`

- The name `bmi` is then used in `calculateBMI` function to refer to `weight` and `height` values

- Also see how useful `alert` is in `bmi.js`
Forms in HTML with js (next)

• An HTML form has attributes: method and action

• action attribute is tied to a js function that handles the form events

• See forms.html
Conditional HTML with js

- Using a form to decide which HTML page to display using a hyperlink.
  - See js5.html, js5.js, hike.html, and surf.html

- Using a form to decide what HTML code to display this time.
  - See js6.html and js6.js
From the JavaScript tutorial

- Let’s see the following together in class
  - JS Introduction
  - JS Where To
  - JS Output
    - When you try the console.log example, use “Inspect Element” with a right click on a browser window to get to the “Console” window. (We will see more on this in the next lecture when we do debugging)
  - JS Syntax
  - JS Statements
  - JS Variables
  - JS Operators
  - JS Data Types (skip objects for now)
  - JS Functions
- (You may stop at this point for now in the tutorial – we can come back and study more when we need to later)
Next time

- JavaScript debugging