

# JavaScript and AJAX

## Variables and APIs

Huw Davies

# JavaScript and AJAX

- Variables
  - Named boxes
  - Hold values
    - Simple numbers or strings of characters
    - Complex structures such as functions, objects and arrays
  - Loosely typed
    - The type is assigned each time a value is assigned
      - (A value is put in the box)
  - Must be declared before being used

# JavaScript and AJAX

- Variable types
  - Number
  - String
  - Boolean
  - Object
  - Function

# JavaScript and AJAX

- Declaring variables
  - Use the keyword '**var**'
  - **var** aNumber;
  - **var** aString;

# JavaScript and AJAX

- Variables can be initialised with their declaration
  - **var** aNumber = 12.34;
  - **var** aString = "12.34";
  - **var** langs = new Array("JavaScript", "PHP", "C++");
  - **var** map = new google.maps.Map(element, options);

# JavaScript and AJAX

- Variable assignment
  - The act of assigning a value to a variable
  - Done with a single equals sign ("=")
    - Or one of its variants...
  - Called the "assignment operator"
  - Does NOT mean, “is equal to”

# JavaScript and AJAX

- If a variable has already been declared (and optionally initialised), it can be reassigned:

```
var myVar;
```

```
var myOtherVar;
```

```
myVar = "Hello World!";
```

```
myVar = 3;
```

```
myOtherVar = 22;
```

```
myVar = myVar + myOtherVar;
```

# JavaScript and AJAX

- Other Operators
  - Numeric
    - +, -, \*, /, %
  - String
    - + (concatenate)
  - Increment/Decrement
    - ++, --
  - Assignment with operator
    - +=, -=, \*=, /=, %=



# JavaScript and AJAX

- Assignment with operator (cont)

**var** a, b;

a = 5; b = 7;

a += b; // equivalent to a = a + b;

a -= b; // equivalent to a = a – b;

a \*= b; // equivalent to a = a \* b;

a /= b; // equivalent to a = a / b;

a %= b; // equivalent to a = a % b;

# JavaScript and AJAX

- Writing to an HTML document
  - Use `document.write("string")`
  - Use `document.writeln("string")` if you want to add a line break
  - The text is injected into the document at the exact location of the `write()` or `writeln()` statement.

# JavaScript and AJAX

- Changing the content of an element
  - Get the element
  - Change its contents
- Assuming the element has an id attribute with a value of 'text':

```
document.getElementById('text').innerHTML =  
    "string";
```

# JavaScript and AJAX

- Exercise 1:
  - Create a new, blank HTML5 page
  - Add an h1 element using document.write
  - The text you want to inject into the page is:
    - `<h1>It works!</h1>`
- Remember
  - All JavaScript statements must be in a `<script>` tag

# JavaScript and AJAX

- Exercise 2:
  - Copy Exercise 1 to a new file
  - Change string output by document.write() to:
    - `<h1 id='fickle'>It Works!</h1>`
  - Use the JavaScript onload event in the `<body>` tag to change the content of the header from “It Works!” to “It's changed!”
    - Omit the apostrophe from the word “it's” if you don't know how to do it (bonus points for anyone who works it out)

# JavaScript and AJAX

- Google Maps allows you to put free interactive maps on your web pages
- You can put a map of
  - Any scale
  - Any type: roadmap, satellite, terrain or street map
  - Centre the map at any location
  - Add markers to the map
- Version 3 does **not** require registration with Google

# JavaScript and AJAX

- Map Types:
  - ROADMAP: displays the normal, default 2D tiles of Google Maps
  - SATELLITE: displays photographic tiles
  - HYBRID: displays a mix of photographic tiles and a tile layer for prominent features (roads, city names)
  - TERRAIN: displays physical relief tiles for displaying elevation and water features (mountains, rivers, etc)

# JavaScript and AJAX

- Steps for creating a map:
  - Declare the application as HTML5 in the `<!DOCTYPE>`
  - Include the Maps API JavaScript in a `<script>` tag
  - Create a DIV with the id "map-canvas" to hold the Map
  - Create a JavaScript object literal to hold the map properties
  - Create a "Map" object, passing it the div element along with the map properties
  - Add a marker (optional)
  - Add an information window (optional)



# JavaScript and AJAX

- DEMONSTRATION: creating a map step-by-step
  - Handout (Google Maps API – Getting Started)
  - Follow along if you like...

# JavaScript and AJAX

## Homework (not assessed)

- Create a web page that includes a map centred on a location of your choice
  - Add a marker
  - Add a street view control
  - Add an info window and a listener to display it when the marker is clicked