JavaScript
Lecture 3d (The DOM)

Waterford Institute of Technology

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JavaScript Introduction

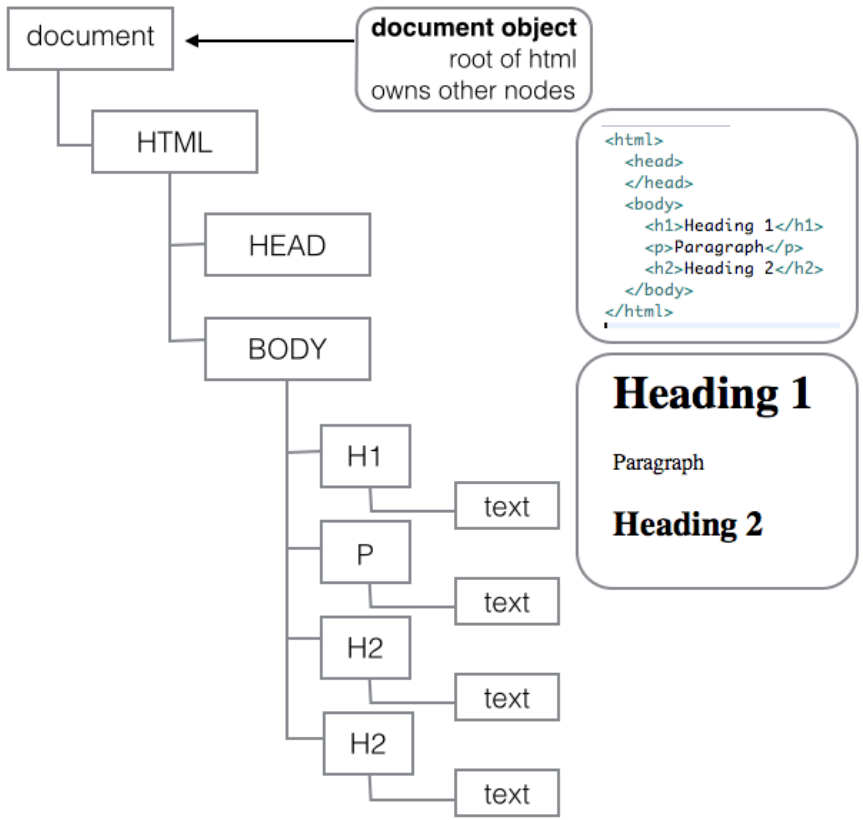
Topic discussed

- Document Object Model (DOM)

JavaScript

Document Object Model

The **DOM**



DOM

Document Object Model

The **DOM**

- A World Wide Web Consortium (W3C) Standard
- Defines standard for accessing web documents
- Represents the displayed web page
- Each element represented in the DOM by its own object
  - Access and modify individual elements
  - Add and delete elements

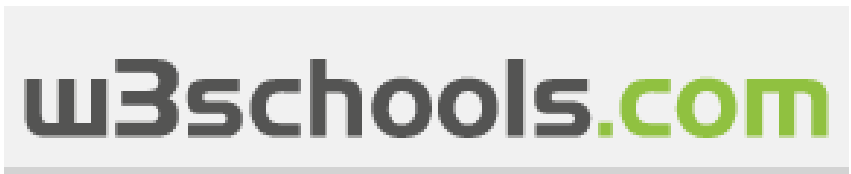
```
<script>
  document.getElementById('demo').innerHTML = 'Hello JavaScript!';
</script>
```

HTML DOM Document Object

HTML DOM Nodes

In the HTML DOM (Document Object Model), everything is a node:

- The document itself is a document node
- All HTML elements are element nodes
- All HTML attributes are attribute nodes
- Text inside HTML elements are text nodes
- Comments are comment nodes



DOM

The Web Browser

On opening HTML document in browser:

- It becomes a **document object**
  - The **document object** is root node of HTML document
  - **document object** provides properties and methods to access node objects from within JavaScript.

```
<script>
  let x = document.getElementsByName('map');
  alert(map.length);

</script>
```

DOM Access

Demo change text

DOM Access

Using DOM method

```
<!DOCTYPE html>
<html>
  <body>
    <p id="demo">Click the button to change this text.</p>
    <button onclick="domAccess()">Try it</button>
    <script src="dom.js"></script>
  </body>
</html>
```

```
//file: dom.js
function domAccess() {
    document.getElementById('demo').innerHTML = 'Hi ICTSkills';
}
```

DOM Access

Using jQuery

```
<!DOCTYPE html>
<html>
  <body>
    <p id="demo">Click the button to change this text.</p>
    <button onclick="jQueryAccess()">Try it</button>
    <script src="jquery-2.0.0.js"></script>
    <script src="jq.js"></script>
  </body>
</html>
```

```
//file: jq.js
function jQueryAccess() {
  $('#demo').html('Hi ICTSkills');
}
```

HTML Tags

Attributes **name** and **id** are not interchangeable

name: Identifies value in form data

id: Uniquely identifies an element so you can access it

```
//View (Semantic UI)
<input id="paypal" name="methodDonated" value="paypal" type="radio">
<label for="paypal">PayPal</label>
<input id="direct" name="methodDonated" value="direct" type="radio">
<label for="direct">Direct</label>
```

```
//Controller (Play): attribute name is methodDonated; content is value
public static void donate(..., String methodDonated)
```

HTML Nodes

Methods to retrieve nodes

- document.getElementById(id)
  - **id** unique on a page hence *getElementById*
- document.getElementsByName(name)
  - returns array of elements with **name** attribute = *name*
  - **name** need not be unique hence *getElementsByName*
- node.getElementsByTagName(tagName)
  - returns array of elements with **tagName** attribute = *tagName*

Get element by id

Simple demo `document.getElementById(id)`

Prints the height of image whose *id="img1"*

Native JavaScript

```
//in html file
<img src="img/01.png" id="img1">
//in javascript file
let image = document.getElementById('img1');
alert('Image height is ' + image.height);
```

jQuery

```
//in html file
<img src="img/01.png" id="img1">
//in javascript file
alert('Image height is ' + $('#img1').height());
```

Get elements by name

Simple demo `document.getElementsByName(name)`

Discovers images with attribute *name="imgs"*

Native JavaScript

```
let images = document.getElementsByName('imgs');
for (let i = 0; i < images.length; i++) {
  alert('Image height is ' + images[i].height);
}
```

jQuery

```
let $images = $('[name="imgs"]');
images.each(function () {
  alert('Image height is ' + $(this).height());
});
```

Get elements by tagName

Simple demo `node.getElementsByTagName(tagName)`

Can be used on a sub-tree, not just entire document

Native JavaScript

```
let imgDiv = document.getElementById('ictskills-images');
let images = imgDiv.getElementsByTagName('img');
for (let i = 0; i < images.length; i++) {
  alert('Image height is ' + images[i].height);
}
```

jQuery

```
//let images: only those contained in node <div id="ictskills-imgs">
//with attribute name="imgs", e.g.: <img src="img/01.png" name="imgs">
let $images = $('#ictskills-imgs [name=\'imgs\']');
images.each(function () {
  alert('Image height is ' + $(this).height());
});
```

Hide | Reveal Elements

Using Native JavaScript

HTML

```
<p id="text">Watch me appear and disappear</p>
<button onclick="hide()">Hide</button>
<button onclick="reveal()">Reveal</button>
```

JavaScript

```
function hide() {
    document.getElementById('text').style.visibility = 'hidden';
}

function reveal() {
  document.getElementById('text').style.visibility = 'visible';
}
```

Hide | Reveal Elements

Using jQuery

HTML

```
<p id="text">Watch me appear and disappear</p>
<button onclick="hide()">Hide</button>
<button onclick="reveal()">Reveal</button>
```

jQuery

```
 function hide() {
  $('#text').hide();
}

function reveal() {
  $('#text').show();
}
```

Semantic UI

Enable Dropdown Box using JQuery

HTML

```
<div class="ui selection dropdown">
  <input name="amountDonated" type="hidden">
  <div class="default text">Amount</div>
  <i class="dropdown icon"></i>
  <div class="menu">
    <div class="item" data-value="100">$100</div>
    <div class="item" data-value="200">$200</div>
    <div class="item" data-value="300">$300</div>
  </div>
</div>
```

jQuery

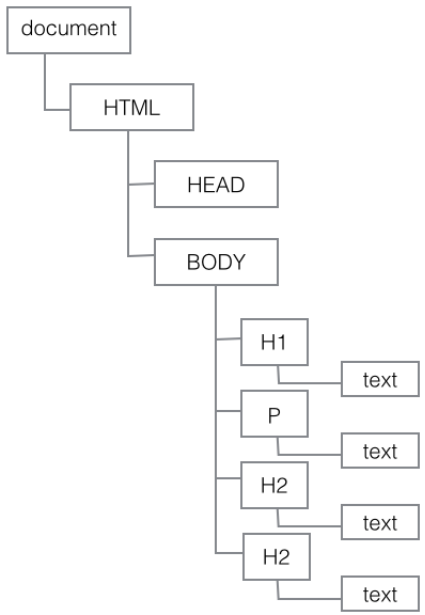
```
//Ensure you use latest version jQuery
//http://code.jquery.com/jquery-latest.min.js
<script>$('.ui.selection.dropdown').dropdown('enable');</script>
```

The DOM

Concluding with one expert's view

DOM (Document Object Model)

- "A vast source of incompatibilites, pain and misery" –Douglas Crockford



Summary

- Document Object Model (DOM)
  - HTML page underlying data structure.
  - Difficult development environment.
  - Better to use jQuery v native JavaScript.

References

Applicable to JavaScript 3a, 3b, 3c, 3d

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2. MDN: Mozilla Developer Network - Arrow functions

`https://developer.mozilla.org/en/docs/Web/JavaScript/Reference/Functions/Arrow_functions`

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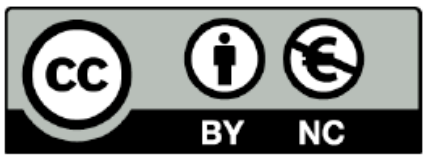

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