JavaScript
Lecture 3a (Client-side application)

Waterford Institute of Technology

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JavaScript Introduction

Topics discussed

- Scripts
- Chrome Developer Tools
- Firefox Developer Tools

Script Tags

Inserts program in html document

```
<script></script>
```

- Allows program in html
- Bad idea to place JavaScript in html
- Instead use source tags

```
<!DOCTYPE html>
<html>
  <head>
  </head>
  <body>
    ...
    ...
    <script src="js/jquery-2.0.0.js"></script>
    <script src="js/reportMap.js"></script>
  </body>
```

Script Tags

Where to locate

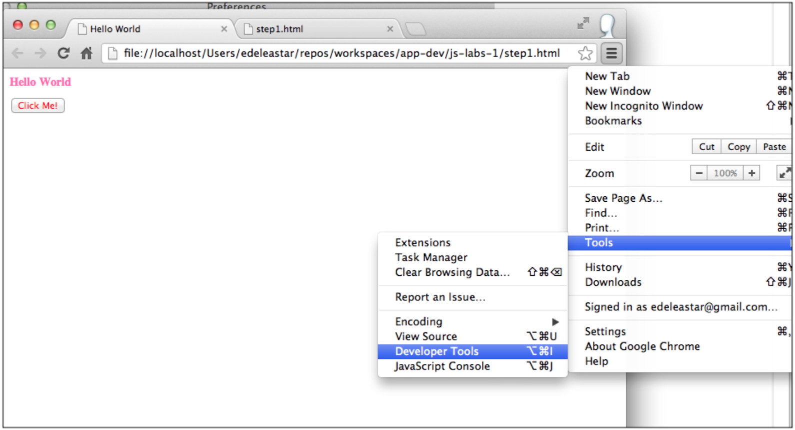
`<script></script>`

- Script files may have big impact on page load
- Place tags close as possible to bottom of body
- Place css <link> high as possible in head
- Reduce number of script files as much as possible
- Minify script files in release versions
  - Has big impact on load time

Chrome Dev Tools

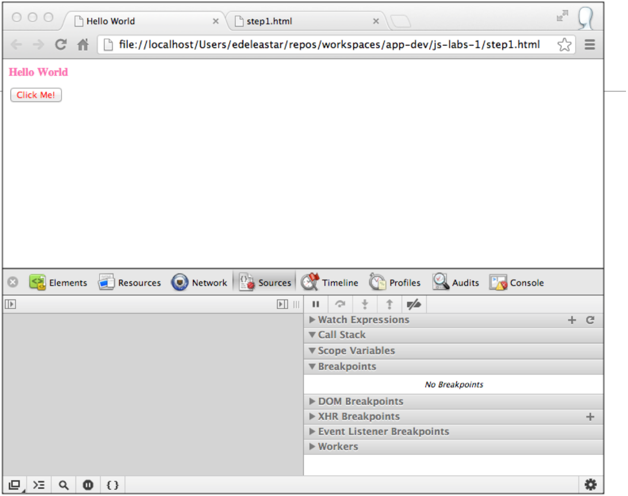
Web authoring & debugging tools

View->Developer Tools



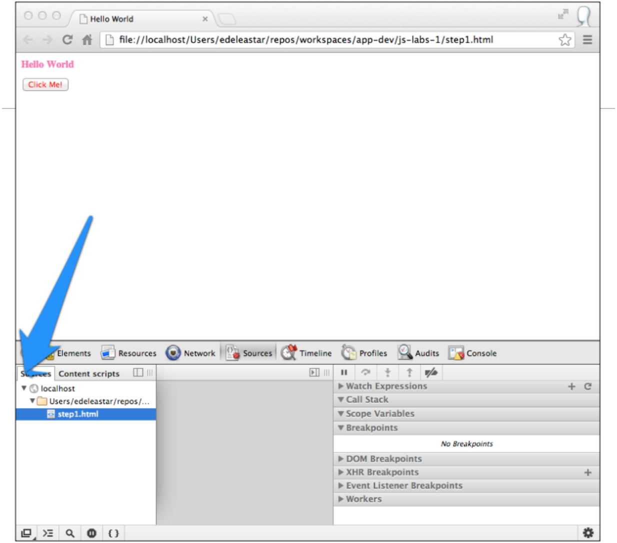
Chrome Dev Tools

Web authoring & debugging tools



Chrome Dev Tools

Web authoring & debugging tools



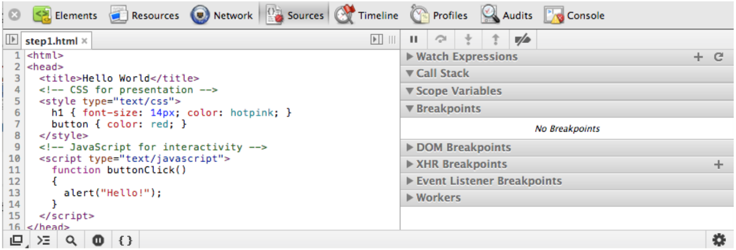
file://localhost/Users/edeleastar/repos/workspaces/app-dev/js-labs-1/step1.html

Hello World

Chrome Dev Tools

Web authoring & debugging tools

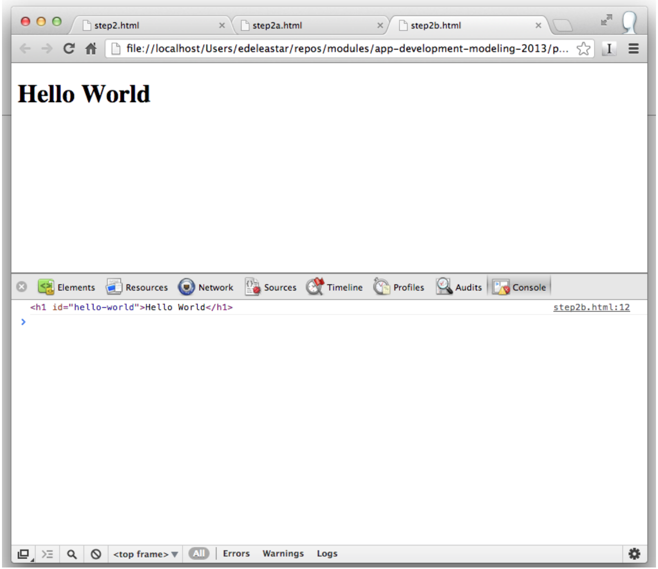
Source view in Developer Tools



```
<html>
<head>
  <title>Hello World</title>
  <!-- CSS for presentation -->
  <style type="text/css">
    h1 { font-size: 14px; color: hotpink; }
    button { color: red; }
  </style>
  <!-- JavaScript for interactivity -->
  <script type="text/javascript">
    function buttonClick()
    {
      alert("Hello!");
    }
  </script>
</head>
```

Chrome Dev Tools

Web authoring & debugging tools



Hello World

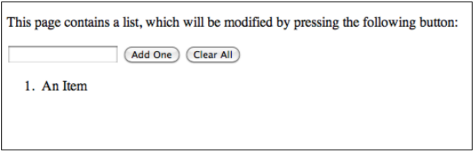
```
<h1 id="hello-world">Hello World</h1>                    step2b.html:12
>
```

Example

Button press causes invocation JavaScript function

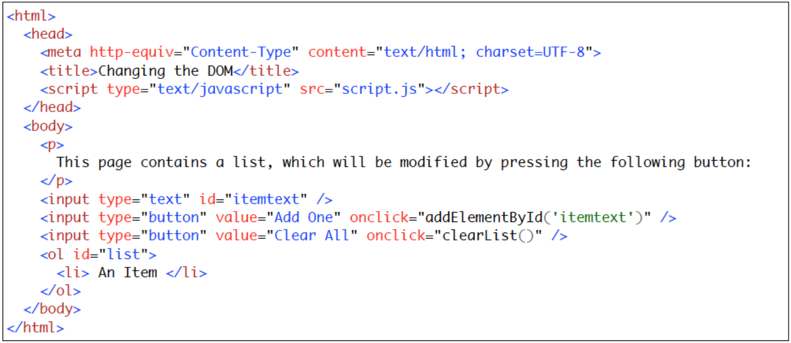
Page contains:

- paragraph <p>
- input elements <input>
  - text field
  - buttons
- list



This page contains a list, which will be modified by pressing the following button:

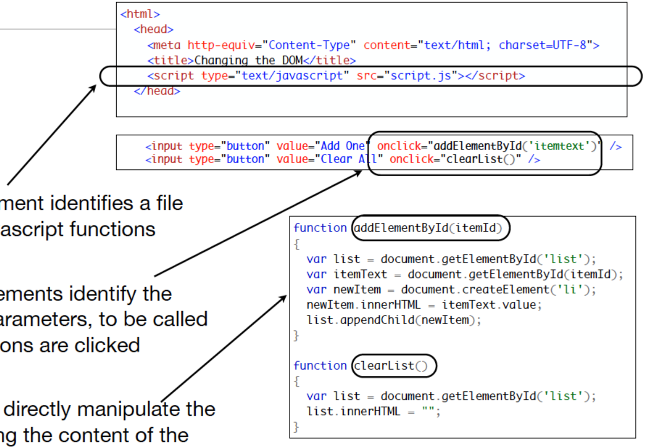
1. An Item



```
<html>
  <head>
    <meta http-equiv="Content-Type" content="text/html; charset=UTF-8">
    <title>Changing the DOM</title>
    <script type="text/javascript" src="script.js"></script>
  </head>
  <body>
    <p>
      This page contains a list, which will be modified by pressing the following button:
    </p>
    <input type="text" id="itemtext" />
    <input type="button" value="Add One" onclick="addElementById('itemtext')" />
    <input type="button" value="Clear All" onclick="clearList()" />
    <ol id="list">
      <li> An Item </li>
    </ol>
  </body>
</html>
```

Example

JavaScript functions



```
<html>
  <head>
    <meta http-equiv="Content-Type" content="text/html; charset=UTF-8">
    <title>Changing the DOM</title>
    <script type="text/javascript" src="script.js"></script>
  </head>
```

```
    <input type="button" value="Add One" onclick="addElementById('itemtext')" />
    <input type="button" value="Clear All" onclick="clearList()" />
```

```
function addElementById(itemId)
{
  var list = document.getElementById('list');
  var itemText = document.getElementById(itemId);
  var newItem = document.createElement('li');
  newItem.innerHTML = itemText.value;
  list.appendChild(newItem);
}

function clearList()
{
  var list = document.getElementById('list');
  list.innerHTML = "";
}
```

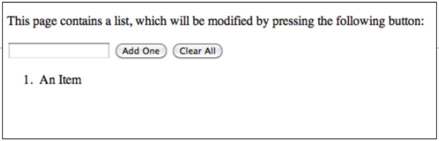
script.js

- The script element identifies a file containing javascript functions
- The button elements identify the functions + parameters, to be called when the buttons are clicked
- The functions directly manipulate the DOM, changing the content of the current page

Static v Dynamic

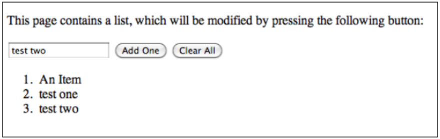
JavaScript enabled page

Example



This page contains a list, which will be modified by pressing the following button:

1. An Item



This page contains a list, which will be modified by pressing the following button:

test two

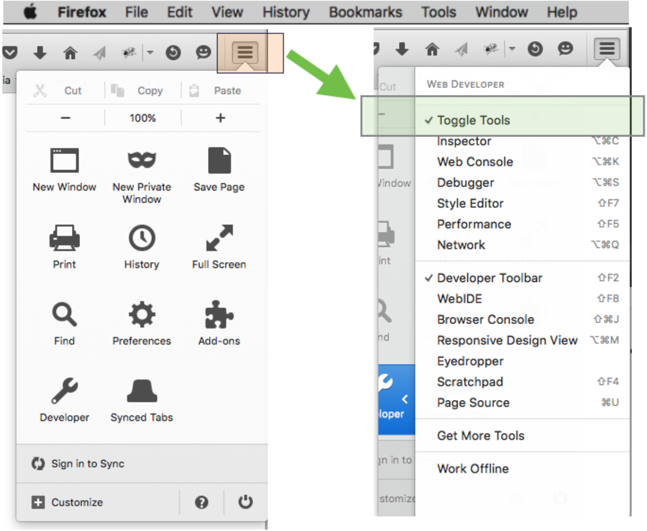
1. An Item
2. test one
3. test two

- For a static page, clicking on a link/button takes the browser to a new page (new url)

- With a dynamic page (javascript enabled), clicking on a button may change the *current* pages structure, content or style

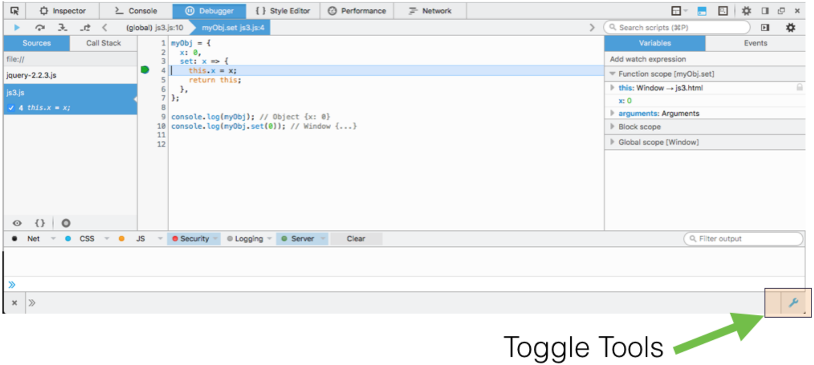
Firefox Dev Tools

Web authoring & debugging tools



Firefox Dev Tools

Web authoring & debugging tools



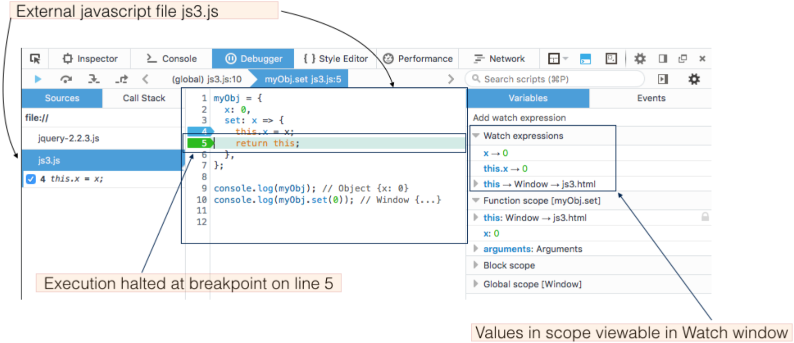
```
myObj = {
  x: 0,
  set: x => {
    this.x = x;
    return this;
  },
};

console.log(myObj); // Object {x: 0}
console.log(myObj.set(0)); // Window {...}
```

Toggle Tools

Firefox Dev Tools

Web authoring & debugging tools



External javascript file js3.js

Execution halted at breakpoint on line 5

Values in scope viewable in Watch window

```
1  myObj = {
2    x: 0,
3    set: x => {
4      this.x = x;
5      return this;
6    },
7  };
8
9  console.log(myObj); // Object {x: 0}
10 console.log(myObj.set(0)); // Window {...}
11
12
```

Add watch expression

Watch expressions
- x → 0
- this.x → 0
- this → Window → js3.html

Function scope [myObj.set]
- this: Window → js3.html
- x: 0
- arguments: Arguments

Block scope

Global scope [Window]

Summary

- Scripts
  - How to load - in html or external files
  - Strong recommendation to use external files only
  - Number scripts
  - Minification - use in production
- Developer tools
  - Chrome
  - Firefox
  - Regular use encouraged
  - May be somtimes advantageous to simultaneously use both

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