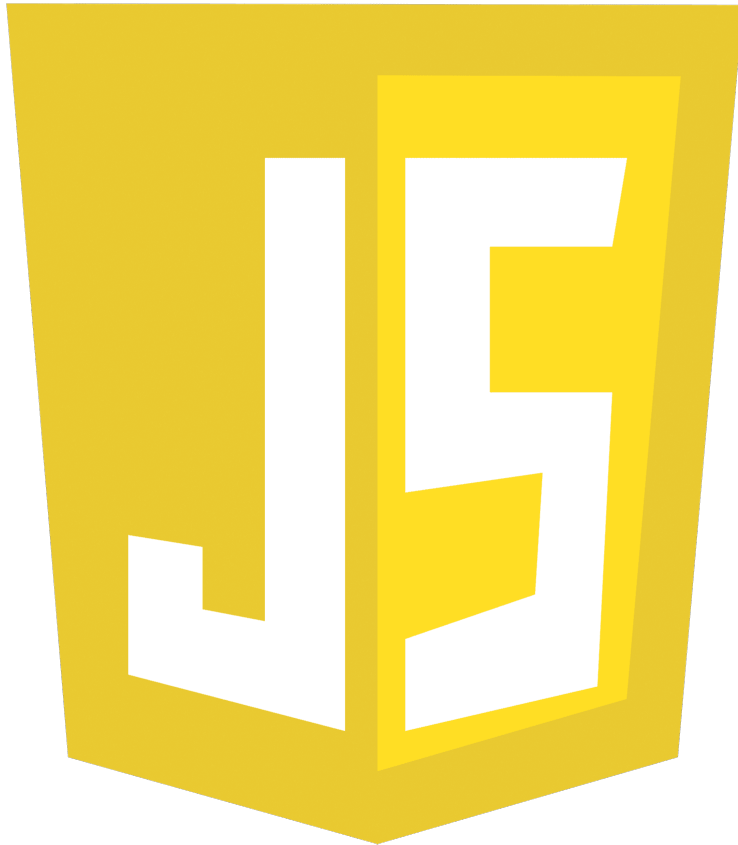# JavaScript

SCC.241

ONLINE TUTORIAL
ON JAVASCRIPT
(+HTML+CSS)

- **Read these slides**
- **Complete the tasks**

Aims & Objectives

- ## Objective
  - To prepare you for the remaining labs and group coursework tasks

- ## After completing this material you should be able to:
  - Comprehend the code and functionality of simple JavaScript web-apps
  - Understand how to edit simple web-apps in Visual Studio Code
  - Apply the knowledge to subsequent lab exercises

Assessment

- Assessment
  - Moodle Quiz consisting of multiple questions
  - Complete the quiz by WK2 Monday 5pm
  - Summative Assessment:
    - Pass/Fail : To achieve a pass, complete the quiz before deadline
      - Multiple attempts allowed
    - Aim to achieve 100% score through thorough understanding of the concepts

Steps

Do you have prior experience with JavaScript and web-development?

If YES:
1. Attempt the quiz on Moodle
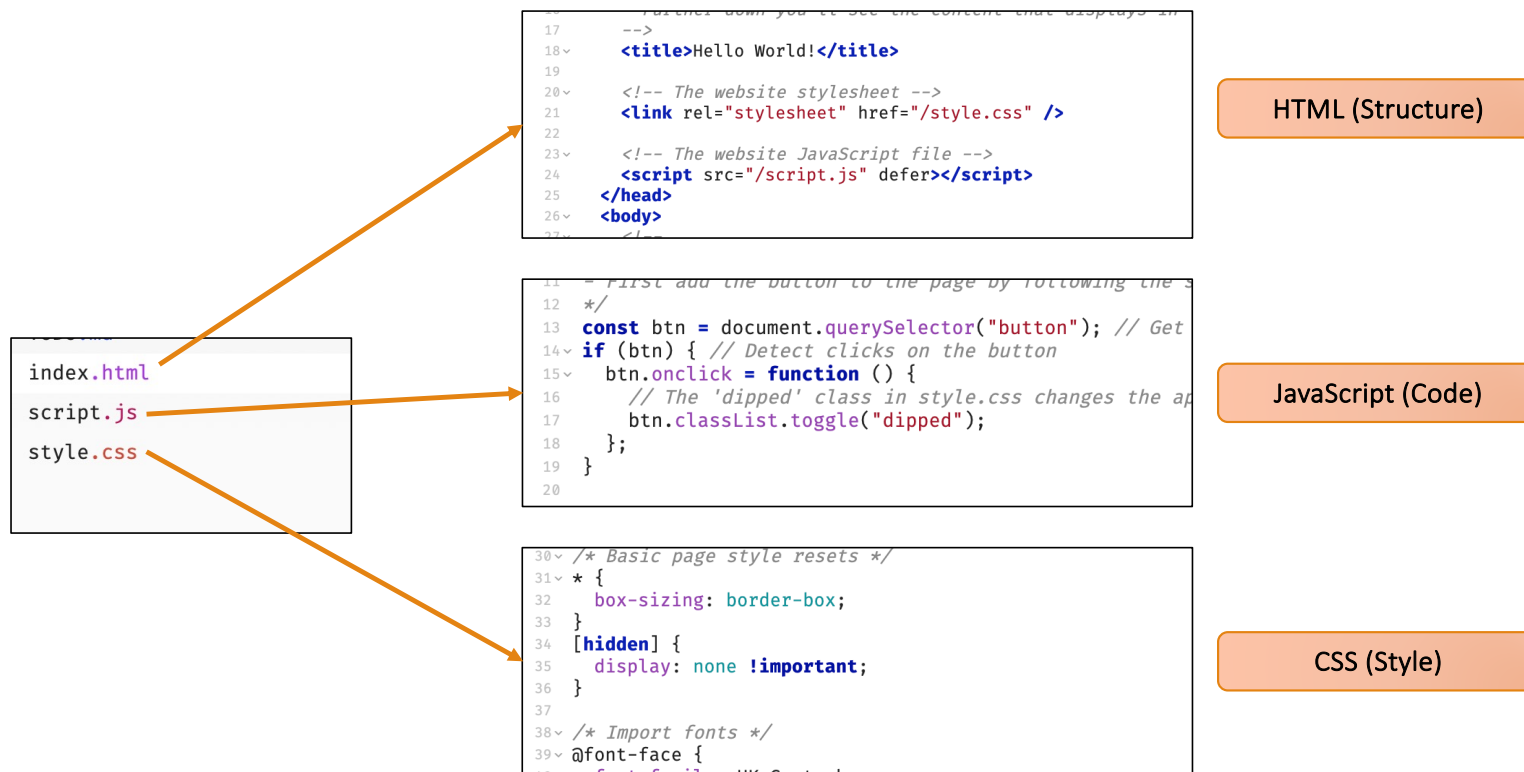2. Review slides

If NO (/a little/maybe/not sure):
1. Work through slides and complete all tasks
2. Attempt the quiz on Moodle

Exercise

Objectives:

1. Understand the structure of a static website
2. (Re?)Familiarize yourself with VSCode
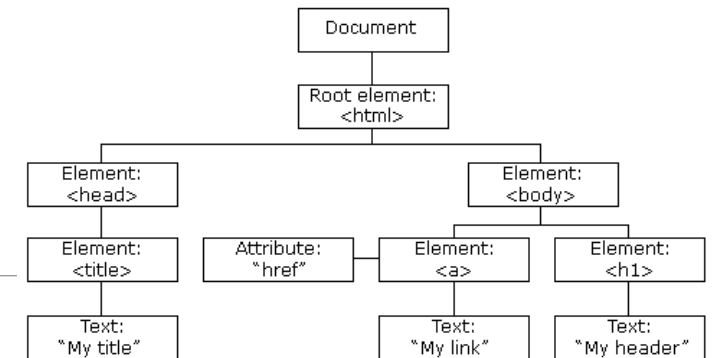3. Learn to use browser-based developer tools

Structure of a static website

```
17        -->
18v       <title>Hello World!</title>
19
20v       <!-- The website stylesheet -->
21        <link rel="stylesheet" href="/style.css" />
22
23v       <!-- The website JavaScript file -->
24        <script src="/script.js" defer></script>
25      </head>
26v    <body>
```

HTML (Structure)

```
11     = First add the button to the page by following the
12     */
13     const btn = document.querySelector("button"); // Get
14v    if (btn) { // Detect clicks on the button
15v      btn.onclick = function () {
16         // The 'dipped' class in style.css changes the ap
17         btn.classList.toggle("dipped");
18       };
19     }
20
```

index.html
script.js
style.css

JavaScript (Code)

```
30v  /* Basic page style resets */
31v  * {
32     box-sizing: border-box;
33   }
34   [hidden] {
35     display: none !important;
36   }
37
38v  /* Import fonts */
39v  @font-face {
```

CSS (Style)

HTML

For more info on DOM see
https://www.w3schools.com/js/js_htmldom.asp

- index.html

- Follows a DOM (Document Object Model)

- Is a tree of elements/tags
  - <tag> Element is this bit including its open and close tags </tag>

- Structures the page, defines what elements will be shown

- Focuses on content not how it is shown
  - Styling from CSS provides how the content is shown
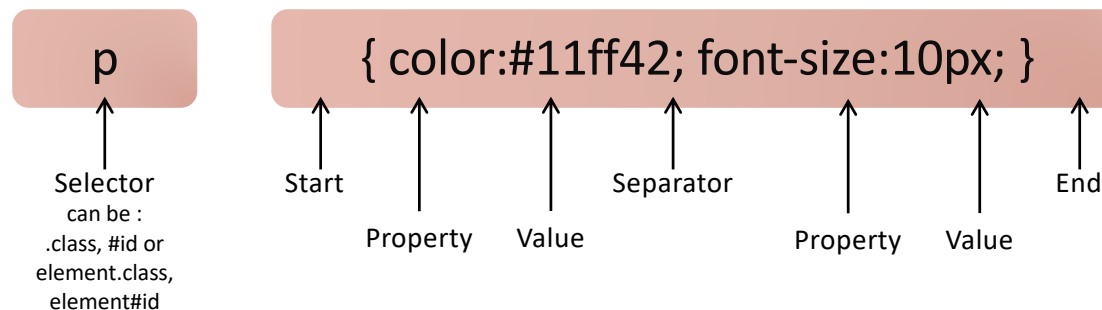 - Responsiveness is handled through DOM events and JavaScript code

CSS

- Defines style rules which are used in index.html
  - For more info see https://www.w3schools.com/css/

- Stored in a separate style.css file OR defined within a style element within HTML file
  - Linked from index.html: <link rel="stylesheet" href="/style.css" /> OR
  - <style> #para1 {text-align: center; color: #11ff42;} </style>

- Simplest form of CSS

p	{ color:#11ff42; font-size:10px; }

Selector
can be :
.class, #id or
element.class,
element#id

Start   Property   Value   Separator   Property   Value   End

- Styling can be for size, colour, position, font, border, margin, padding and everything that relates to the visual aspects of an HTML element.

JavaScript

- Code which is run via index.html
- Stored in a separate script.js file OR defined within a script element within HTML file
  - \<script src="/script.js" \>\</script\> OR
  - \<script type="text/javascript"\>alert("Hello World!");\</script\>
- Extends the dynamic behaviour provided by HTML elements
- JS can react to HTML events associated with HTML elements

Visual Studio Code
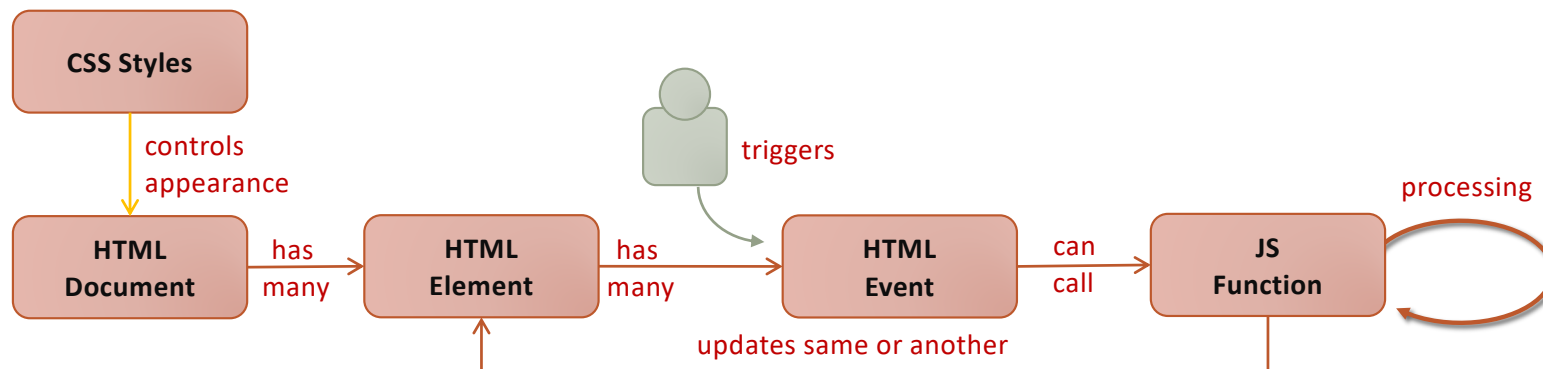
- Go to https://scc-source.lancs.ac.uk/25/scc241/javascripttutorial in Chrome
  - You'll need to login using your uni credentials

- Click 'Code' then 'zip' to download the project
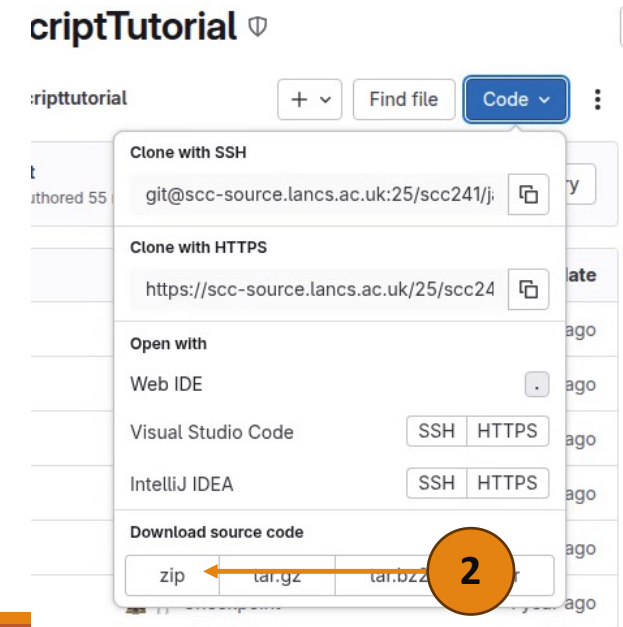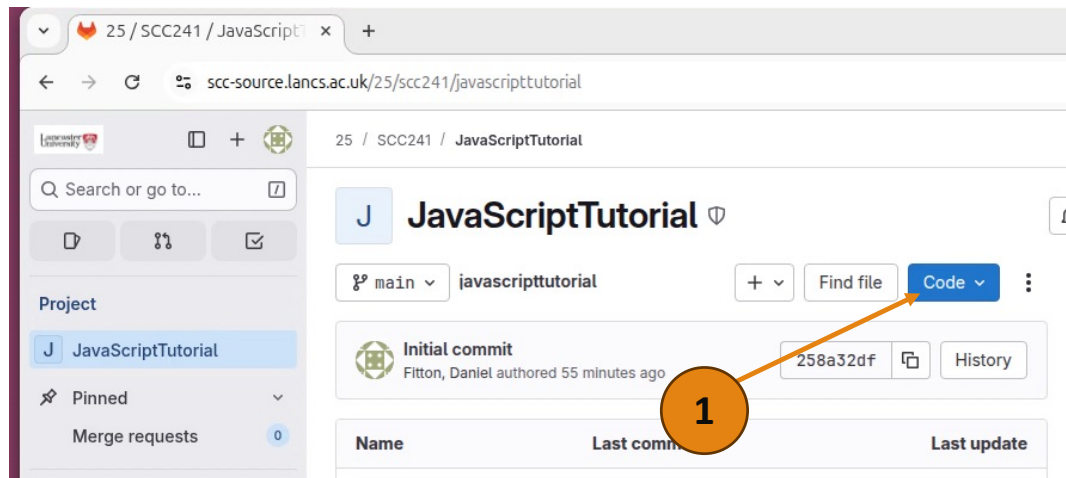
Visual Studio Code

- Double click on the .zip to uncompress
- Open the folder from the download in Visual Studio Code
  - If you don't see the blue button then use File -> Open Folder…
- Click 'Yes, I trust the authors' when prompted
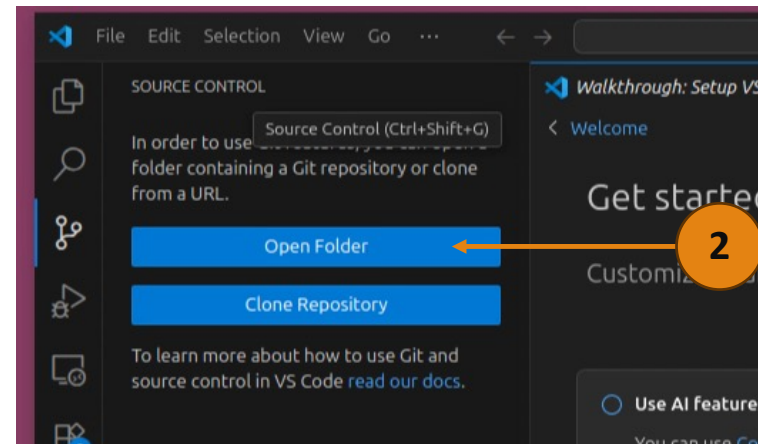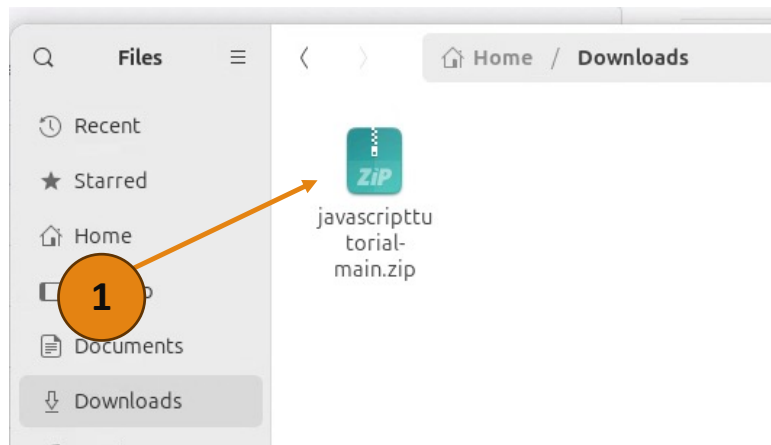
Visual Studio Code

- Select index.html in the project Explorer
- Click 'Run' -> 'Run Without Debugging'
- Select 'Web App (Chrome)'
- Note the 'url' is just a path to the filesystem
  - You can just open index.html in a browser without VS Code
  - I prefer Firefox but Chrome is almost identical
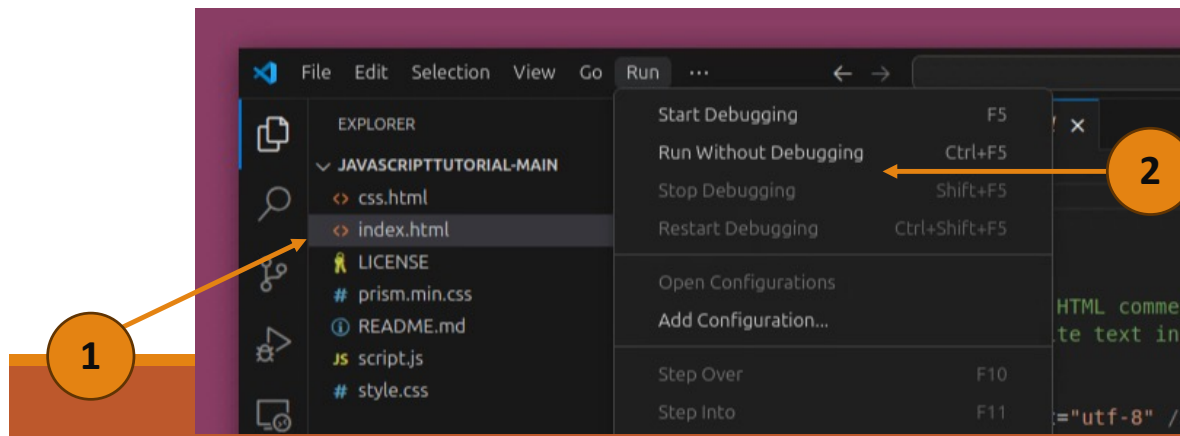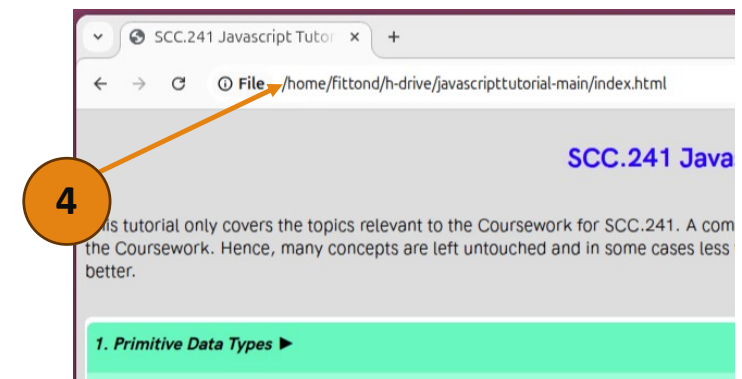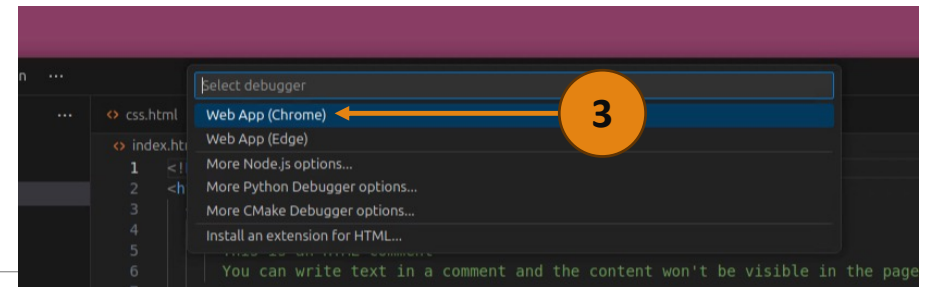
Making some changes

- After each code change save the file then reload in your browser to test
- Edit index.html
  - On line 22 change the title of the page (e.g. to your name or something)
- Edit script.js
  - After line 7 add:
    - alert("Page Loaded");
- Edit style.css
  - Change the background colours of the page (e.g. to #ff6600)
    - Look at lines 18-20 (--color-bg0:)
    - A colour picker can be found at https://www.w3schools.com/colors/colors_picker.asp
  - Change the text colour
    - Add 'color: blue;' after line 28 (ie inside the ':root {' block)

```
5   // Print a message in the
6   // Use your menus or righ
7   console.log("Hello 🌐");
```

Browser-based Development Tools - Console

Console
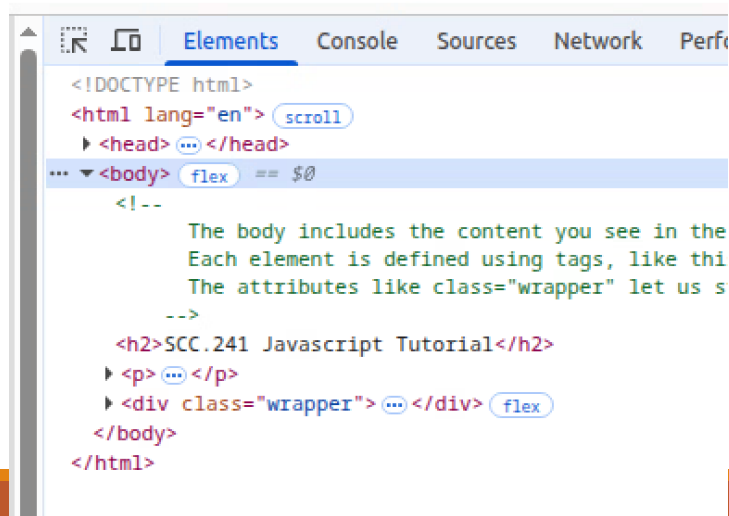
- Very useful in identifying code errors and behaviours
  - Code errors are logged to console along with the source file and line number
  - console.log can be used in Javascript code to log debug information to the console

- The console can be opened in many ways depending on the browser
  - In Chrome/Firefox F12 brings up the Web Developer Tools (includes Console and Document inspector)
  - Click 'Console', Find 'Hello 🌐', Check script.js to see where this came from

- We can type JavaScipt code into the console and when we hit return it runs
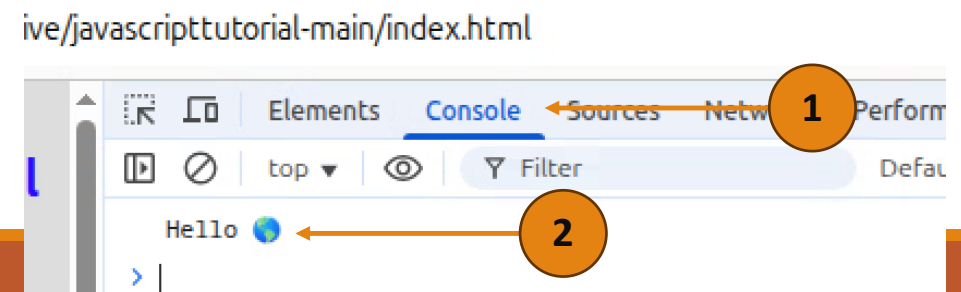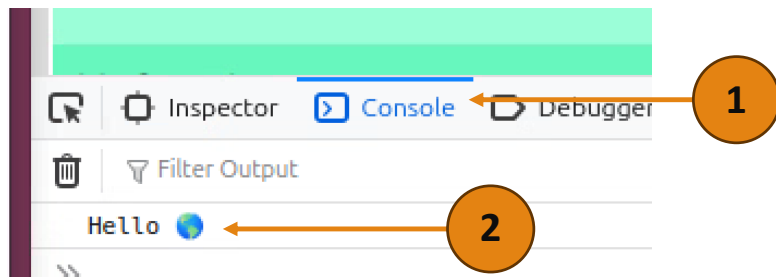
Browser-based Development Tools - DI
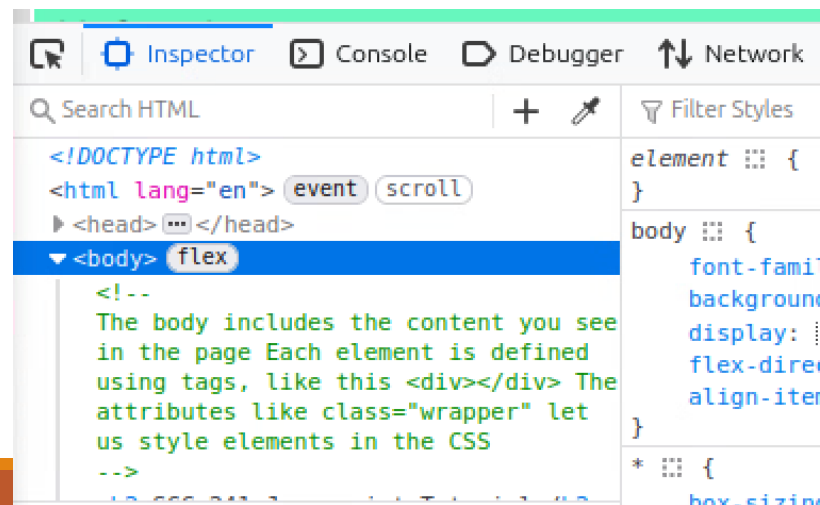
Document Inspector ('Elements' in Chrome)

- Can be used to explore the structure of the web-page
- Can be used to test changes to the CSS (enable/disable with check boxes)

Browser-based Development Tools - Debugger

Debugger ('Sources' in Chrome)

- Provides a very useful interface to allow stepping through code
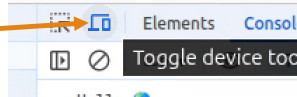- By setting breakpoints on code or through "Pause on exception", code can be debugged
- Information can be found at
  - https://developer.chrome.com/docs/devtools/javascript
  - https://firefox-source-docs.mozilla.org/devtools-user/debugger/index.html
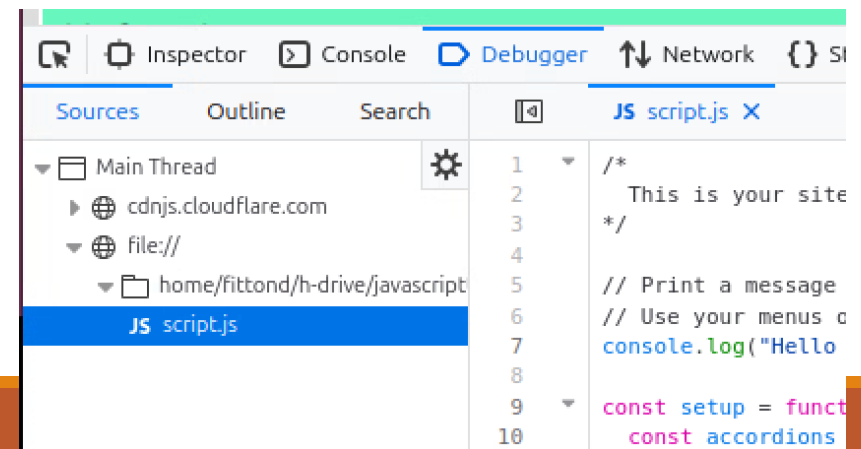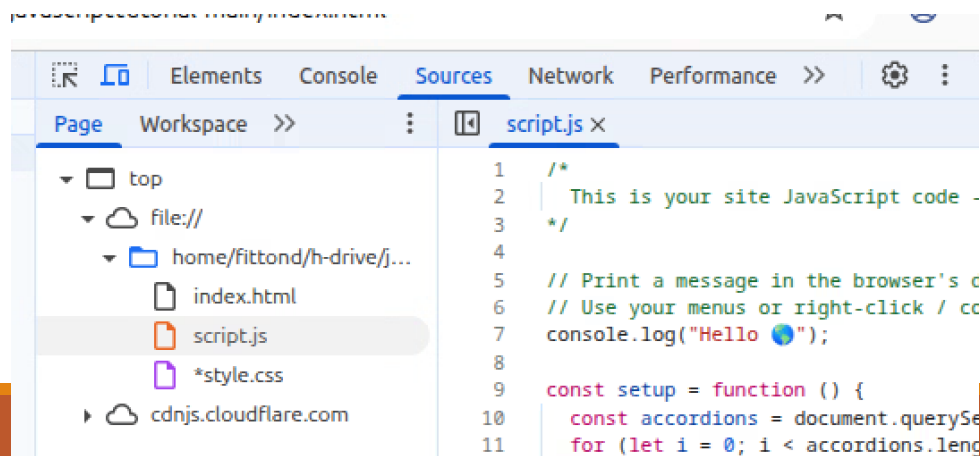
Next Steps

- Go back to your browser (index.html - SCC.241 Javascript Tutorial)

- Read through each section
  - Open the Browser console and execute each block of code provided
    - Click at the bottom of the console after '>' or '>>', paste in code, hit enter.
    - For the first time you'll need to input 'allow pasting' and hit enter.
    - In Chrome, if you can't select text in the page click here
  - Try to ensure you understand how each code example works
    - Ideally, change the code and see what the effect is.
    - Look up anything that is unclear on W3Schools: https://www.w3schools.com/js/

- Attempt Quiz (again see Moodle)
  - Quiz is formatively assessed; unlimited number of attempts are possible.
  - However, to earn the bonus point for WK1, you need to finish the quiz at least once.

Elements   Console   Sources   Network

Toggle device toolbar - Ctrl+Shift+M

Appendix

Useful resources

HTML: W3Schools

- Start at https://www.w3schools.com/html/html_basic.asp

- Use the 'Try it Yourself' tool

JavaScript: Learn X in Y minutes

- http://learnxinyminutes.com/docs/javascript/