INN701 module
Data visualisation with Javascript

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Agenda

- Introductions
- Quiz
- Javascript and HTML basics
- Essential d3.js concepts
- Simple visualisations
- Interactive visualisations
- Visualising personal project data

Introductions

- about me…
  - find me: andrew.gibsons.id.au
- about you…
  - name, research focus, status, goal/s for this module
- About this module…
  - some foundation content, mostly hands on, interactive, driven by your needs
  - resources:

Quiz

- What is the main lesson from Ansombe's Quartet and John Snow's visualisation?
- Give 2 reasons why it is helpful to write code to visualise data?
- Describe the differences between HTML, Javascript, CSS, & content.
- What does DOM mean and why is it important?
- What is JSON? Provide an example.
- Describe the end result of the HTML below…

```
<svg width="50" height="50">
    <circle cx="25" cy="25" r="22" fill="blue" stroke="gray" stroke-width="2"/>
</svg>
```

Javascript and HTML Basics - 1

- Download the starter code from GitHub either using git or by downloading the zip file: https://github.com/andrewresearch/datavisualisation

- If downloading the zip file, unzip into an appropriate directory

- Open the starterCode/starter_01 folder in Brackets

- Click on starter.html in Brackets, and click the lightning bolt to open the web view in Chrome.

- You're now ready to start working with basic HTML and Javascript

Javascript and HTML Basics - 2

- The HTML file:
  - What do these elements do?`<head>`,`<title>`,`<script>`,`<link>`,`<body>`,`<h1>`,`<div>`
  - What is the difference between the 2 d3js script elements?
  - Why is one of the script elements at the end of the doc?
  - Some of the tags have attributes - what are they and what do they do?
  - What does this do? `<!-- What is this? -->`
- Make some changes:
  - Change the title, heading and text.
- How do we change the colour of the heading and the text to something more useful?

Javascript and HTML Basics - 3

- The CSS file:
  - See if you can change the heading and text colour by making changes in this file.
  - What else can you change?
    Take a look at: http://www.w3schools.com/css/
  - CSS with element, and ‘class’ / ‘id’ attributes
  - Create your own CSS file and reference it from the HTML file. Create a paragraph element with a class ‘myPara’. Make 3 or 4 dummy paragraphs and style them with CSS in your own CSS file. Create an id element for one paragraph to format it differently.
  - There are many ways to select which elements to style
    See this tool: http://www.w3schools.com/cssref/trysel.asp

```css
/* the cascading style sheet for my custom tags */

p, h1 {
    color: black;
    font-family: Serif;
}

.myPara {
    color: green;
}

#mySpecialPara {
    color: #2266ee;
    font-family: "Helvetica",Sans-serif;
    font-size: 10px;
    background-color: gray;
    text-align: center;
}

.codePara {
    background-color: #aaaaaa;
    color: #000066;
    font-family: Monospace;
    font-size: 12px;

}
```

Javascript and HTML Basics - 4

- The Javascript file controls action - it contains the program/s that are run by the browser in response to different events.
- What is `var` and `function()`?
- To see what's going on in the browser, we can enable the javascript console and the developer tools.
- Follow the instructions in the comments of the `starter.js` file and observe what happens. Each time you save, the browser should auto-reload so that you can see the changes.

```
//declare a function and assign it to a variable

var startupFunction = function (message1, message2) {
    console.log("The message is: " + message);
    alert(message2);
};


//declare a variable and assign a string to it

var myMessage = "The startup function has been called";


/*
call the startupFunction that we declared with 2
parameters - the variable we declared, and a second string
*/
startupFunction(myMessage,"This is my alert message");
```

Essential d3.js Concepts - 1

- Open starter_02
  - `select(), selectAll(), enter()`
  - `function(d,i)`

```
//anonymous function with d and i

function (d, i) {
    console.log(“The value of this instance is: " + d);
    console.log(“The index of this instance is: " + i);
};
```

Essential d3.js Concepts - 2

- Open starter_03
  - loading data - multiple options, but we'll just use one:
    - CSV files
    - JSON format
- scaling - we're using the data itself to set the parameters for our visualisation
- polygons

Simple visualisations

- Line Chart (starter_04)
  - Line types
  - Adding Axes
- Bar Chart (starter_05)
  - Vertical
  - Shifting Ticks

Interactive visualisations

- Dynamic updating
- Linking to other data
- Animation and effects

Personal project data

- Can you visualise your data differently?
- Can you make your data visually interactive?