**Swinburne University of Technology**

**COS30045 - Data Visualisation**

**Lab Exercise Demonstration 1**

**(Exercises 1.1 - 2.4)**

Student: Nguyen Anh Duc – 103488489

Lecturer: Ms, Nguyen Thuy Linh

Tutor: Mr. Vu Ngoc Binh

**Lab 1.1**

A screenshot of a computer

Description automatically generated

<!DOCTYPE html>

<html lang="en">

<head>

    <meta charset="UTF-8" />

    <meta name="description" content="Data Visualisation Exercise 1" />

    <meta name="keywords" content="HTML, CSS" />

    <meta name="author" content="Your name here" />

    <title>Task 1.1 HTML and CSS Demo Page</title>

    <!--Insert description of exercise  -->

    <style>

        body {

            font-family: Arial, sans-serif;

            line-height: 1.6;

            margin: 20px;

            background-color: #f4f4f4;

        }

        h1 {

            color: #333;

            text-align: center;

            font-size: 2.5em;

        }

        h2 {

            color: #555;

            text-align: center;

            font-size: 1.5em;

            margin-bottom: 20px;

        }

        p {

            max-width: 800px;

            margin: 0 auto;

            padding: 20px;

            border-radius: 8px;

        }

        ul {

            margin-top: 10px;

            padding-left: 350px;

        }

        figure {

            text-align: center;

            margin-top: 20px;

        }

        img {

            width: 300px;

            height: auto;

            margin: 10px;

            border-radius: 10px;

            border: 2px solid #ddd;

        }

        button {

            padding: 10px 20px;

            margin: 5px;

            border: none;

            border-radius: 5px;

            cursor: pointer;

            font-size: 1em;

        }

        .button1 {

            background-color: #4CAF50;

            color: white;

        }

        .button2 {

            background-color: #2196F3;

            color: white;

        }

        .button3 {

            background-color: #f44336;

            color: white;

        }

        footer {

            text-align: center;

            margin-top: 50px;

            font-size: 0.9em;

            color: #777;

        }

        .image-container {

            text-align: center;

            margin: 20px 0;

        }

        .image-container img {

            display: inline-block;

        }

    </style>

</head>

<body>

    <h1>Title of Article about Interesting Visualisation</h1>

    <h2>Author of Interesting Article</h2>

    <p>

        Pets and the Pandemic

        A report from Animal Medicines Australia (AMA) has found that many Australians took the opportunity to introduce

        a pet

        into their household during the pandemic. <b>Their survey indicated that there was a significant increase in the

            percent of

            households taking in a new dog, fish or bird.</b> Their research also indicated that pets had a number of

        positive

        influences on their lives such as:

    <ul>

        <li>companionship</li>

        <li>better mental health</li>

        <li>joy and happiness</li>

    </ul>

    </p>

    <p>With the increase in pet ownership the AMA are encouraging <i>policy makers</i> to consider the needs of

        companion

        animals and their owners when considering rental, strata and body corporate regulations are well as accepting

        animals in

        <i>public places and transport.</i>

    </p>

    <figure>

        <img src="/pet\_ownership\_in\_australia\_table.png" alt="Trulli" style="width:70%">

        <figcaption>Fig 1. Comparison of Pet Ownership in 2019 and 2021. Data source: <a

                href="https://animalmedicinesaustralia.org.au/wp-content/uploads/2021/08/AMAU005-PATP-Report21\_v1.41\_WEB.pdf">Animal

                Medicines Australia's Report</a></figcaption>

    </figure>

    <div class="image-container">

        <img src="cat.jpg" alt="cat in Australia">

        <img src="dog.png" alt="dog in Australia">

        <img src="fish.jpg" alt="fish in Australia">

    </div>

    <footer>COS30045 Data Visualisation</footer>

</body>

</html>

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**Lab 1.2**

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<!DOCTYPE html>

<html lang="en">

<head>

    <meta charset="UTF-8" />

    <meta name="description" content="Data Visualisation Exercise 1" />

    <meta name="keywords" content="HTML, CSS" />

    <meta name="author" content="Your name here" />

    <title>Task 1.2 Javascript</title>

    <!--Insert description of exercise  -->

    <style>

        body {

            font-family: Arial, sans-serif;

            line-height: 1.6;

            margin: 20px;

            background-color: #f4f4f4;

        }

        h1 {

            color: #333;

            text-align: center;

            font-size: 2.5em;

        }

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            margin-bottom: 20px;

        }

        p {

            max-width: 800px;

            margin: 0 auto;

            padding: 20px;

            border-radius: 8px;

        }

        ul {

            margin-top: 10px;

            padding-left: 350px;

        }

        figure {

            text-align: center;

            margin-top: 20px;

        }

        img {

            width: 300px;

            height: auto;

            margin: 10px;

            border-radius: 10px;

            border: 2px solid #ddd;

        }

        button {

            padding: 10px 20px;

            margin: 5px;

            border: none;

            border-radius: 5px;

            cursor: pointer;

            font-size: 1em;

        }

        .button1 {

            background-color: #4CAF50;

            color: white;

        }

        .button2 {

            background-color: #2196F3;

            color: white;

        }

        .button3 {

            background-color: #f44336;

            color: white;

        }

        footer {

            text-align: center;

            margin-top: 50px;

            font-size: 0.9em;

            color: #777;

        }

        .image-container {

            text-align: center;

            margin: 5px 0;

        }

        .image-container img {

            display: inline-block;

        }

        .button-container {

            margin-left: 250px;

        }

    </style>

    <script>

        // Function to change image, caption, and alt text

        function showImage(imageSource, captionText, altText) {

            // Get the image and caption elements

            const imageElement = document.getElementById('visualizationImage');

            const captionElement = document.getElementById('imageCaption');

            // Change the image source, alt text, and caption

            imageElement.src = imageSource;

            imageElement.alt = altText;

            captionElement.innerHTML = captionText;

        }

    </script>

</head>

<body>

    <h1>Title of Article about Interesting Visualisation</h1>

    <h2>Author of Interesting Article</h2>

    <p>

        Pets and the Pandemic

        A report from Animal Medicines Australia (AMA) has found that many Australians took the opportunity to introduce

        a pet

        into their household during the pandemic. <b>Their survey indicated that there was a significant increase in the

            percent of

            households taking in a new dog, fish or bird.</b> Their research also indicated that pets had a number of

        positive

        influences on their lives such as:

    <ul>

        <li>companionship</li>

        <li>better mental health</li>

        <li>joy and happiness</li>

    </ul>

    </p>

    <p>With the increase in pet ownership the AMA are encouraging <i>policy makers</i> to consider the needs of

        companion

        animals and their owners when considering rental, strata and body corporate regulations are well as accepting

        animals in

        <i>public places and transport.</i>

    </p>

    <!-- Buttons to switch between images -->

    <div class="button-container">

        <button type="button" class="button button1"

            onclick="showImage('Screenshot 2024-09-09 154209.png', 'Fig 1. Percent of pets owned by Australians in 2019', 'Fig 1. Percent of pets owned by Australians in 2019')">2019</button>

        <button type="button" class="button button2"

            onclick="showImage('Screenshot 2024-09-09 154116.png', 'Fig 2. Percent of pets owned by Australians in 2021', 'Fig 2. Percent of pets owned by Australians in 2021')">2021</button>

        <button type="button" class="button button3"

            onclick="showImage('Screenshot 2024-09-09 154707.png', 'Fig 3. Percent of pets owned by Australians in 2019 and 2021', 'Fig 3. Percent of pets owned by Australians in 2019 and 2021')">Both</button>

    </div>

    <figure id="imageContainer">

        <img id="visualizationImage" src="/Screenshot 2024-09-09 154209.png" alt="Fig 1. Percent of pets owned by Australians in 2019" style="width:70%">

        <figcaption id="imageCaption">Fig 1. Percent of pets owned by Australians in 2019</figcaption>

    </figure>

    <div class="image-container">

        <img src="cat.jpg" alt="cat in Australia">

        <img src="dog.png" alt="dog in Australia">

        <img src="fish.jpg" alt="fish in Australia">

    </div>

    <footer>COS30045 Data Visualisation</footer>

</body>

</html>

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**Lab 1.3**

<!DOCTYPE html>

<html lang="en">

<head>

    <meta charset="UTF-8" />

    <meta name="description" content="Data Visualisation Exercise 1" />

    <meta name="keywords" content="HTML, CSS" />

    <meta name="author" content="Your name here" />

    <title>Task 1.3 SVG Drawings</title>

    <!--Insert description of exercise  -->

</head>

<body>

    <h1>Drawing Shapes with SVG</h1>

    <svg width="500" height="60" style="background-color:slategrey;">

        <g transform="translate(20, 0)">

            <circle cx="25" cy="30" r="25" fill="cornflowerblue" />

            <rect x="50" y="5" width="50" height="50" fill="rgb(100, 149, 237)" />

            <ellipse cx="140" cy="30" rx="40" ry="25" fill="rgba(100, 149, 237, 0.5)" />

            <line x1="0" y1="30" x2="180" y2="30" stroke="black" stroke-width="5" />

        </g>

    </svg>

    <br><br><br>

    <h1>Pet ownership in 2019</h1>

    <svg width="500" height="300" style="background-color:#6b7c91;">

        <rect x="20" y="150" width="50" height="100" fill="#6795f7" />

        <rect x="90" y="175" width="50" height="75" fill="#6795f7" />

        <rect x="160" y="200" width="50" height="50" fill="#6795f7" />

        <rect x="230" y="220" width="50" height="30" fill="#6795f7" />

        <rect x="300" y="230" width="50" height="20" fill="#6795f7" />

        <rect x="370" y="235" width="50" height="15" fill="#6795f7" />

        <rect x="440" y="240" width="50" height="10" fill="#6795f7" />

    </svg>

    <footer style="color:grey">COS30045 Data Visualisation<br>Joe Bloggs</footer>

</body>

</html>

**A screenshot of a computer

Description automatically generated**

**Lab 2.1**

<!DOCTYPE html>

<html lang="en">

<head>

    <meta charset="UTF-8" />

    <meta name="description" content="Data Visualisation Exercise 1" />

    <meta name="keywords" content="HTML, CSS" />

    <meta name="author" content="Your name here" />

    <title>Task 2.1 D3 Drawing with Data - Bindings</title>

    <!--Insert description of exercise  -->

    <script src="https://d3js.org/d3.v7.min.js"></script>

</head>

<body>

    <h1>The D3 Journey starts here...</h1>

    <!-- <script>

        d3.select("body")

            .append("p")

            .text("New paragraph!");

    </script> -->

    <!-- <h1>Creating and Formatting Paragraphs Elements with D3</h1>

    <script>

        var dataset = [20, 5, 26, 23, 9];

        d3.select("body").selectAll("p")

            .data(dataset)

            .enter()

            .append("p")

            .text(function(d) {

                return d;

            });

    </script> -->

    <h1>Creating and Formatting Paragraphs Elements with D3</h1>

    <script>

        // example from Murray

        var dataset = [20, 5, 26, 23, 9];

        d3.select("body").selectAll("p")

            .data(dataset)

            .enter()

            .append("p")

            .text(function (d) {

                if (d > 10) {

                    return "Warning: Joe watched " + d + " cat videos today.";

                } else

                return "Joe watched " + d + " cat videos today.";

            })

            .style("color", function (d) {

                return d > 10 ? "red" : "black";

            });

    </script>

    <br>

    <footer style="color:grey">COS30045 Data Visualisation<br>Joe Bloggs</footer>

</body>

</html>

**A screenshot of a computer

Description automatically generated**

**Lab 2.2**

<!DOCTYPE html>

<html lang="en">

<head>

    <meta charset="UTF-8" />

    <meta name="description" content="Data Visualisation Exercise 1" />

    <meta name="keywords" content="HTML, CSS" />

    <meta name="author" content="Your name here" />

    <title>Task 2.2 D3 Drawing with Data - Bar Chart</title>

    <!--Insert description of exercise  -->

    <script src="https://d3js.org/d3.v7.min.js"></script>

</head>

<body>

    <h1>Creating a Bar chart with D3</h1>

    <script>

        // example from Murray

        var dataset = [20, 5, 26, 23, 9, 23, 16, 4, 29];

        var w = 500;

        var h = 150;

        var padding = 1;

        var svg = d3.select("body")

            .append("svg")

            .attr("width", w)

            .attr("height", h);

        svg.selectAll("rect")

        .data(dataset)

        .enter()

        .append("rect")

        .attr("x", function(d, i) {

            return i \* (w / dataset.length) ;

        })

        .attr("y", function(d) {

            return h - (d\* 4);

        })

        .attr("width", w / dataset.length - padding)

        .attr("height", function(d) {

            return d \* 4;

        })

        .attr("fill", "teal")

        svg.selectAll("text")

        .data(dataset)

            .enter()

            .append("text")

            .text(function (d) {

                return d;

            })

            .attr("x", function (d, i) { return i \* (w / dataset.length) + (w / dataset.length - padding) / 2; })

            .attr("y", function (d) {

                return h - (d \* 4) + 14;

            })

            .attr("fill", "white")

            .attr("font-family", "sans-serif")

            .attr("text-anchor", "middle")

    </script>

    <br><br>

    <footer style="color:grey">COS30045 Data Visualisation<br>Joe Bloggs</footer>

</body>

</html>

**A screenshot of a computer

Description automatically generated**

**Lab 2.3**

<!DOCTYPE html>

<html lang="en">

<head>

    <meta charset="UTF-8" />

    <meta name="description" content="Data Visualisation Exercise 1" />

    <meta name="keywords" content="HTML, CSS" />

    <meta name="author" content="Your name here" />

    <title>Task 2.3 D3 Drawing with Data - Scatter Plot</title>

    <!--Insert description of exercise  -->

    <script src="https://d3js.org/d3.v7.min.js"></script>

</head>

<body>

    <h1>Creating a Scatter Plot with D3</h1>

    <script>

        // example from Murray

         var dataset = [

                [5, 20, 5], [480, 90, 20], [250, 50, 15], [100, 33, 10],

                [330, 95, 25], [410, 12, 8], [475, 44, 12], [25, 67, 18],

                [85, 21, 14], [220, 88, 22]

            ];

        var w = 600;

        var h = 150;

        var padding = 1;

        var svg = d3.select("body")

            .append("svg")

            .attr("width", w)

            .attr("height", h);

        svg.selectAll("circle")

            .data(dataset)

            .enter()

            .append("circle")

            .attr("cx", function (d, i) {

                return d[0];

            })

            .attr("cy", function (d) {

                return d[1];

            })

            .attr("r", function (d) {

                return d[2];

            })

            .attr("fill", function (d) {

                if ((d[0] > 410) | (d[1] > 80)) {

                    return "blue";  // Red color for some points

                } else {

                    return "slategrey"; // Default color

                }

            });

        svg.selectAll("text")

            .data(dataset)

            .enter()

            .append("text")

            .text(function (d) {

                return d[0] + "," + d[1];

            })

            .attr("x", function (d) { return d[0]; })

            .attr("y", function (d) {

                return d[1];

            })

            .attr("fill", "red")

            .attr("font-family", "sans-serif")

            .attr("font-size", "11px")

    </script>

    <br>

    <footer style="color:grey">COS30045 Data Visualisation<br>Joe Bloggs</footer>

</body>

</html>

**A screenshot of a computer

Description automatically generated**

**Lab 2.4**

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**Index.html :**

<!DOCTYPE html>

<html lang="en">

<head>

    <meta charset="UTF-8" />

    <meta name="description" content="Data Visualisation Exercise 1" />

    <meta name="keywords" content="HTML, CSS" />

    <meta name="author" content="Your name here" />

    <title>Task 2.4 D3 Loading Data from CSV</title>

    <script src="https://d3js.org/d3.v7.min.js"></script>

    <script src="/chart.js"></script>

</head>

<body>

    <h1>D3 - Loading Data from CSV</h1>

    <p id="chart"></p>

    <br>

    <h1>Charts drawn from CSV file</h1>

    <p id="chart2"></p>

    <p>Fig 1: Pet Ownership in 2019</p>

    <br>

    <p id="chart3"></p>

    <p>Fig 2: Pet Ownership in 2021</p>

    <br>

</body>

<footer style="color:grey">COS30045 Data Visualisation<br>Joe Bloggs</footer>

</html>

**Chart.js :**

function init() {

    d3.csv("Task\_2.4\_data.csv").then(function (data) {

        console.log(data);

        wombatSightings = data;

        barChart(wombatSightings);

    })

    function barChart() {

        var w = 600;

        var h = 150;

        var padding = 1;

        var colorScale = d3.scaleLinear()

            .domain([d3.max(wombatSightings, function (d) { return d.wombats; }), d3.min(wombatSightings, function (d) { return d.wombats; })])

            .range(["yellow", "orange"]); // Map values to a color from YELLOW to orange

        var svg = d3.select("#chart")

            .append("svg")

            .attr("width", w)

            .attr("height", h);

        svg.selectAll("rect")

            .data(wombatSightings)

            .enter()

            .append("rect")

            .attr("x", function (d, i) {

                return i \* (w / wombatSightings.length);

            })

            .attr("y", function (d) {

                return h - (d.wombats \* 4);

            })

            .attr("width", w / wombatSightings.length - padding)

            .attr("height", function (d) {

                return d.wombats \* 4;

            })

            .attr("fill", function (d) {

                return colorScale(d.wombats);  // Apply the color scale based on data value

            })

        svg.selectAll("text")

            .data(wombatSightings)

            .enter()

            .append("text")

            .text(function (d) {

                return d.wombats;

            })

            .attr("x", function (d, i) { return i \* (w / wombatSightings.length) + (w / wombatSightings.length - padding) / 2; })

            .attr("y", function (d) {

                return h - (d.wombats \* 4) + 14;

            })

            .attr("fill", "white")

            .attr("font-family", "sans-serif")

            .attr("text-anchor", "middle")

    }

    d3.csv("pet\_ownership.csv").then(function (data2) {

        console.log(data2);

        data2019 = data2;

        barChart2(data2019);

    })

    function barChart2() {

        var w = 600;

        var h = 200;

        var padding = 1;

        var colorScale = d3.scaleLinear()

            .domain([d3.max(data2019, function (d) { return d.pets2019; }), d3.min(data2019, function (d) { return d.pets2019; })])

            .range(["blue", "navy"]);

        var svg = d3.select("#chart2")

            .append("svg")

            .attr("width", w)

            .attr("height", h);

        svg.selectAll("rect")

            .data(data2019)

            .enter()

            .append("rect")

            .attr("x", function (d, i) {

                return i \* (w / data2019.length);

            })

            .attr("y", function (d) {

                return h - (d.pets2019 \* 4) - 40;

            })

            .attr("width", w / data2019.length - padding)

            .attr("height", function (d) {

                return d.pets2019 \* 4;

            })

            .attr("fill", function (d) {

                return colorScale(d.pets2019);  // Apply the color scale based on data value

            })

        svg.selectAll("text")

            .data(data2019)

            .enter()

            .append("text")

            .text(function (d) {

                return d.animal;

            })

            .attr("x", function (d, i) { return i \* (w / data2019.length) + (w / data2019.length - padding) / 2; })

            .attr("y", function (d) {

                return h - 12;

            })

            .attr("fill", "green")

            .attr("font-family", "sans-serif")

            .attr("font-size", "15px")

            .attr("text-anchor", "middle")

    }

    d3.csv("pet\_ownership.csv").then(function (data3) {

        console.log(data3);

        data2021 = data3;

        barChart3(data2021);

    })

    function barChart3() {

        var w = 600;

        var h = 200;

        var padding = 1;

        var colorScale = d3.scaleLinear()

            .domain([d3.max(data2021, function (d) { return d.pets2021; }), d3.min(data2021, function (d) { return d.pets2021; })])

            .range(["blue", "navy"]);

        var svg = d3.select("#chart3")

            .append("svg")

            .attr("width", w)

            .attr("height", h);

        svg.selectAll("rect")

            .data(data2021)

            .enter()

            .append("rect")

            .attr("x", function (d, i) {

                return i \* (w / data2021.length);

            })

            .attr("y", function (d) {

                return h - (d.pets2021 \* 4) - 40;

            })

            .attr("width", w / data2021.length - padding)

            .attr("height", function (d) {

                return d.pets2021 \* 4;

            })

            .attr("fill", function (d) {

                return colorScale(d.pets2021);  // Apply the color scale based on data value

            })

        svg.selectAll("text")

            .data(data2021)

            .enter()

            .append("text")

            .text(function (d) {

                return d.animal;

            })

            .attr("x", function (d, i) { return i \* (w / data2021.length) + (w / data2021.length - padding) / 2; })

            .attr("y", function (d) {

                return h - 12;

            })

            .attr("fill", "green")

            .attr("font-family", "sans-serif")

            .attr("font-size", "15px")

            .attr("text-anchor", "middle")

    }

}

window.onload = init;

A screenshot of a computer

Description automatically generated

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Description automatically generated