

# COMP519 Practical 3

## Cascading Style Sheets (1)

### Introduction

- This worksheet contains exercises that are intended to familiarise with Cascading Style Sheets (CSS). While you work through the tasks below compare your results with those of your fellow students and ask for help and comments if required.
- You might proceed more quickly if you cut-and-paste code from that PDF file. Note that a cut-and-paste operation may introduce extra spaces into your code. It is important that those are removed and that your code exactly matches that shown in this worksheet.
- The exercises and instructions in this worksheet assume that you use the Department's Linux systems.
- To keep things simple, we will just use a text editor and a terminal. You can use whatever text editor you are most familiar or comfortable with.
- If you do not manage to get through all the exercises during this practical session, please complete them in your own time before the next practical takes place.
- Use the HTML5 Specification [6], the COMP519 Lecture Notes [2, Lectures 5–6], Stack Overflow [3] and W3Schools [4] as references for any information on HTML that you might need.

### Exercises

1. Let us start by investigating size units in the context of choosing the size of a font.
  - a. Create a file named page03A.html in your public\_html directory with the following content:

```
<!DOCTYPE html>
<html>
<!-- File: page03A.html
      Creation: 2023-01-26
      Description: Size Units / Fonts
-->
<head>
  <title>Size Units / Fonts</title>
  <script type="text/javascript" src="page03A.js"></script>
</head>
<body>
  <h2>List with font-size 100%</h2>
  <ol style="font-size: 100%;">
    <li style="font-size: 1em;">Quick brown fox 1em</li>
    <li style="font-size: 1rem;">Quick brown fox 1rem</li>
    <li style="font-size: 12pt;">Quick brown fox 12pt</li>
    <li style="font-size: 16px;">Quick brown fox 16px</li>
    <li style="font-size: 100%;">Quick brown fox 100%</li>
  </ol>
```

```

<h2>List with font-size small</h2>
<ol style="font-size: small;">
  <li style="font-size: 1em;">Quick brown fox 1em</li>
  <li style="font-size: 1rem;">Quick brown fox 1rem</li>
  <li style="font-size: 12pt;">Quick brown fox 12pt</li>
  <li style="font-size: 16px;">Quick brown fox 16px</li>
  <li style="font-size: 100%;">Quick brown fox 100%</li>
</ol>
<h2>List with font-size 200%</h2>
<ol style="font-size: 200%;">
  <li style="font-size: 1em;">Quick brown fox 1em</li>
  <li style="font-size: 1rem;">Quick brown fox 1rem</li>
  <li style="font-size: 12pt;">Quick brown fox 12pt</li>
  <li style="font-size: 16px;">Quick brown fox 16px</li>
  <li style="font-size: 100%;">Quick brown fox 100%</li>
</ol>
</body>
</html>

```

- b. Make sure that the permissions for the file are set correctly by using

```
chmod og-rwx ~/public_html/page03A.html
```

- c. In a web browser, open the URL

<https://student.csc.liv.ac.uk/~<user>/page03A.html>

where you need to replace `<user>` with your username.

- d. Look at the three lists and see how font-size varies. Make sure that you understand why some text remains the same size across the three lists while other text changes in size.
- e. Replace the tag `<body>` in `page03A.html` by `<body style="font-size: 24px">`. Save the file and reload it in the web browser. How has the text changed and why?
- f. Font size is only one consideration, although it is an important one. For the aesthetics of a web page it is also important to choose a 'nice' font. To see how to change the font used for a web page, add the following to the head element of `page03A.html`:

```
<link href="https://fonts.googleapis.com/css?family=Roboto+Mono"
      rel="stylesheet">
```

and change the opening body-tag to

```
<body style="font-family: 'Roboto Mono', monospace;">
```

Save the file and reload it in the web browser. How has the text changed? What is a monospace font?

- g. At

<https://fonts.google.com/>

you can find an extensive collection of fonts that you could use. Have a look in your spare time. For the moment move on to the next exercise.

2. Next we investigate size units in the context of divisions.

- a. Create a file named `page03B.html` in your `public_html` with the following content:

```

<!DOCTYPE html>
<html>
<!-- File: page03B.html
      Creation: 2023-01-26
      Description: Size Units / Boxes
-->
<head>
  <title>Size Units / Boxes</title>
  <script type="text/javascript" src="page03B.js"></script>
</head>
<body>
  <div style="width:96px;height:96px;
            border:1px solid #000;background-color:yellow">96px by 96px</div>
  <div style="width:1in;height:1in;
            border:1px solid #000;background-color:red">1in by 1in</div>
  <div style="width:10%;height:10%;
            border:1px solid #000;background-color:orange">10% by 10%</div>
  <div style="width:10vw;height:10vh;color:white;
            border:1px solid #000;background-color:blue">10vw by 10vh</div>
  <table>
    <tr><td>Orientation</td><td id="o"></td></tr>
    <tr><td>Width</td><td id="w"></td></tr>
    <tr><td>Height</td><td id="h"></td></tr>
  </table>
</body>
</html>

```

- b. Make sure that the permissions for the file are set correctly by using

```
chmod og-rwx ~/public_html/page03B.html
```

- c. In a web browser, open the URL

```
http://student.csc.liv.ac.uk/~<user>/page03B.html
```

where you need to replace `<user>` with your username. Make sure that the magnification is 100%.

- d. You should see four coloured rectangles plus a table with information about the orientation, width and height of the browser window. Inside each rectangle you see what size units were used to set the dimensions of the rectangle. The bottom two rectangles (blue and orange) should be wider than the top two rectangles (yellow and red).
- e. The red rectangle is 1 CSS inch wide and 1 CSS inch high. Does that correspond to 1 'real' inch in width and height? If not, why not? If you could figure out what the pixel density of your monitor is, you might be able to figure out why the dimensions of the rectangle are what they are.
- f. For dimensions of the bottom two rectangles, relative units have been used. Resize the browser window and see how the width and height of these two boxes changes.
- g. The width of the blue rectangle is '10vw', that is, 10% of the viewport width while the width of the orange rectangle is '10%', that is, 10% of the width of the surrounding block. If you look carefully you see that the blue rectangle is slightly wider than the orange rectangle. Use the inspect functionality of your web browser to verify that this is true.

Why is that? What is the ‘surrounding block’ of the orange rectangle and why is it slightly narrower than the viewport?

- h. The height of the blue rectangle is ‘10vh’, that is, 10% of the viewport height while the height of the orange rectangle is ‘10%', that is, 10% of the height of the surrounding block. Why does that not seem to work? Refer to [5] for an explanation.
- i. If possible, open the web page in a web browser on a smartphone. Change the orientation of the smartphone from landscape to portrait. Do the yellow and the red rectangle stay the same in visual size?

Look at the window width and height reported at the bottom of the page. We would expect that when you change the orientation from landscape to portrait then width and height just swap. Is this so? Does that help to explain what is going on?

Try to modify page03B.html so that changing the orientation of the smartphone does not change the size of the yellow and the red rectangle. Refer to the notes for Lecture 5 for a solution.

3. We want to improve the visual appearance of the HTML document page02B.html we created in **Practical 2, Exercise 2**.

- a. To preserve the work we did on page02B.html, first create a copy of this file called page03C.html with the same access rights.
- b. Open page03C.html in a web browser.
- c. Open page03C.html in a text editor and add the following HTML markup in the head-element and save the file.

```
<style>  
</style>
```

- d. Add style directives to this style-element and, where necessary, class attributes to the HTML markup for the table-element in page03C.html, to achieve the following:
  - All data and header cells should have borders.
  - All data and header cells should have padding on the left and right of their content of 0.5em.
  - The numbers in data cells should be right-aligned.
  - The names of cities should be left-aligned in their cells.
  - The educational levels ‘NVQ2’ to ‘NVQ4’ in the top header row should be centered in their cells.
  - The labels ‘Count’ and ‘% Rate’ should be right-aligned in their cells.
  - The background colour of all header cells should be light blue.
  - The background colour of every second row should be #F2F2F2, but this should not affect header cells.
  - The table caption should be centred over the table, use a bold font and have a 1ex margin to the table.

Refer to Figure 1 for the look we want to achieve.

- e. The HTML document also contains definitions of the educational levels NVQ2 to NVQ4. Add style directives to the document stylesheet to achieve the following:
  - The definitions of the educational levels should be to the right of the levels themselves, not below them.
  - The educational levels should be in a bold-font and be followed by a colon (both should be achieved by style directives, not by changes to the HTML markup for the definitions). There should be 0.5em padding to the left and right.

### Education and Skills

NVQ Qualifications in UK Core Cities

City	NVQ4		NVQ3		NVQ2	
	Count	% Rate	Count	% Rate	Count	% Rate
Birmingham	241,900	33.2	379,900	52.2	497,100	68.3
Bristol	155,900	49.3	216,300	68.5	256,300	81.1
Cardiff	114,600	46.8	160,400	65.5	196,400	80.2
Glasgow	197,100	45.9	249,600	58.1	297,000	69.1
Leeds	197,600	38.2	301,100	58.3	392,800	76.0
Liverpool	124,800	37.5	186,700	56.1	247,300	74.3
Manchester	169,800	44.1	232,600	60.4	279,800	72.7
Newcastle	80,600	40.5	121,800	61.3	155,700	78.3
Nottingham	70,200	31.2	125,000	55.7	156,900	69.9
Sheffield	166,800	44.1	249,900	66.1	298,900	79.0

NVQ4: HND, Degree and Higher Degree level qualifications  
 NVQ3: 2 or more A levels, or equivalent  
 NVQ2: 5 or more GCSEs at grades A-C, or equivalent

Created by <your name> (<your e-mail address>)

Figure 1: page03C.html

- The educational levels should use a light blue background, their definitions should use a light yellow background. There should be padding of about 2.0em between the educational levels and their definitions. The light yellow background of the definitions should extend to the right roughly as far as the table does.

Again, refer to Figure 1 for the look we want to achieve. As a starting point you may take the style directives in [1, Example 2] and then modify them appropriately.

## References

- [1] Chirp Internet. *CSS: Formatting a Definition List*. The Art of Web. 05 January 2019. URL: <https://www.the-art-of-web.com/css/format-dl/> (accessed 26 January 2023).
- [2] U. Hustadt. *COMP519 Web Programming: Lecture Notes*. Department of Computer Science, University of Liverpool. URL: <https://canvas.liverpool.ac.uk/courses/60872/modules> (accessed 24 January 2023).
- [3] Stack Overflow. *Stack Overflow Site*. 24 January 2023. URL: <https://stackoverflow.com/> (accessed 24 January 2023).
- [4] Refsnes Data. *W3Schools Site*. 24 January 2023. URL: <https://www.w3schools.com/> (accessed 24 January 2023).
- [5] Michael\_B (<https://stackoverflow.com/users/3597276/michael-b>). *Why is percentage height not working on my div? [duplicate]*. Stack Exchange Network. 16 December 2017. URL: <https://stackoverflow.com/questions/31728022/why-is-percentage-height-not-working-on-my-div/31728799#31728799> (accessed 24 January 2023).
- [6] WHATWG, ed. *HTML Living Standard*. 24 January 2023. URL: <https://html.spec.whatwg.org/multipage/> (accessed 24 January 2023).