|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| ✓ | I agree to my visual work being considered for the Computing Student Showcase ([click here](https://www.uos.ac.uk/content/computing-student-showcase-0)) | | | |
| *Criteria* | | *Feedback* | *Available* | *Mark* |
| **Part 1** – Develop a live website that accurately connects to and queries at least one API endpoint using JavaScript. Display the data returned from the API using HTML and CSS. | |  | 30 |  |
| **Part 1** - Integrate responsive web design techniques (RWD) to enable cross-device support. | |  | 10 |  |
| **Part 1** – Utilise appropriate design techniques and front-end technologies to create an accessible and user-friendly design. | |  | 15 |  |
| **Part 2** – Create two professional and detailed wireframes or sketches. | |  | 15 |  |
| **Part 2** – Accurately define the development process undertaken and the technologies utilised. Where appropriate, consider the benefits and disadvantages of different web technologies considering alternatives. | |  | 25 |  |
| **Part 2** – All written components are coherently organised and have been completed to a professional standard. Where appropriate, evidence has been cited from a range of sources including peer-reviewed academic journals. Such sources have been cited and referenced using the correct referencing style. | |  | 5 |  |
|  | | *Total* | 100 |  |

Web Design Report

Introduction to Web Design (Assignment One – 100%)

*Please complete all the sections below:*

# Live Website URL

Live Website URL: http://harrybartlett.uosweb.co.uk/

# Wireframes or Sketches

Graphical user interface

Description automatically generated

Graphical user interface

Description automatically generated

*Diagram

Description automatically generated*

# HTML

The main structure of the project is built in HTML. HTML stands for HyperText Markup Language and is structured using tags. The Data of the website is stored within the opening and closing <head></head> tags, with the main web page content being stored within the opening and closing <body></body> tags. The HTML structure must define the document type at the top of the page using the <!DOCTYPE html> declaration, and this must be written above any tags, this is done so the webpage displays correctly within the browser.

HTML version 1 was first written by Tim Berners-Lee in 1993 and since its first iteration it has been updated many times up till the now HTML 5. Most recent changes from the previous version of HTML allows for new tags that can help better structure a HTML file, these are known as semantic elements which use the name of the element to help define the content within. An example of a couple new semantic elements includes the introduction of header tags which better define the top navigation of the webpage, or the footer tags that better define the information at the bottom of the page, including copyright information, links to all pages or information about the author of the webpage. Although there are new semantic elements, the use of non-semantic elements is still important to a html document and the structure. Unlike semantic elements, non-semantic elements do not define the content based on the name, for example division tags, however it is important to note that these divisions can still be given different classes or id’s that relate to external linked files like Cascading Style Sheets (CSS). Other changes to HTML5 includes a new change to the meta element, known as the charset attribute, the relevancy this has to the related project is that it can be used to specify the character encoding within the html file, allowing for many characters and symbols to be used within the character set, as defined by W3Schools (2022).

# CSS

Cascading Style Sheets (CSS) is a language that can be combined with HTML, its main use is to describe the presentation and allow for further customisation to the HTML page. CSS 3 has switched to module specification, this is dissimilar to older versions CSS 1 and CSS 2 which were single specification, Hazeez (2019) has suggested that the change in this type of specification has allowed different authors to work on independent specifications, at different times. New specifications of CSS 3 are managed by W3C, these are put through a three-level process to test the stability before being published, as stated by Atkins Jr, Etemad, & Rivoal (2022). An example of how CSS 3 has evolved is with the integration of external fonts, allowing for much more options than the fonts provided by CSS 1 and CSS 2, however the disadvantage to using these external fonts is that unlike the fonts provided by CSS 1 and CSS 2, there is no assurance that they are compatible and show the same with every browser. Regular new specifications to CSS 3 although beneficial, can also become reliant on different browsers being regularly updated in order to work.

With the introduction of CSS 3 came a significant amount of customisation. The importance of freedom in customisation means that a web page can communicate its message to the reader more effectively. Although a subjective topic, there is common unity on various rules that popular websites follow in order to retain retention and accessibility to a web page, however over the existence of web-design the rules of how a website should display its information has changed significantly. An example of an on-trend styling technique is the flat design, this can appear crisp and simplistic in comparison to a past-trend such as skeuomorphic, which has a more realistic visual approach. Colour is also an important factor not only in design but also accessibility, the wrong combination of colours or styling could result in the webpage being inaccessible to people with disabilities, the World Health Organisation (2022) estimates that there is 1.3 billion people worldwide with disabilities, therefore consideration must be taken so that the webpage is readable to all. Within the project we can see contrasting text and background colours that clearly distinguish one from the other, the use of a black background with brighter colours like white, yellow and blue, making the text readable whilst having a dark theme to prevent eye strain if viewing in darker environments. The general “feel” of a website can be heavily linked to the chosen colour palette, for websites that need to present important information there may be a lack of styling but an emphasis on simplism in the colour palette, this can differ across western and eastern cultures, where the same two colours can mean different things. Popular websites have begun changing to include multiple versions with selectable light and dark themes, this is important because the theme of the website can affect the viewer retention and accessibility, it also means the viewer isnt limited to one singular theme and can choose from preference depending on the surrounding environment.

SASS, otherwise known as Syntactically Awesome Style Sheets, is a pre-processor of CSS that is an extention of the language. One of the main reasons for having an extention to CSS is so that the code can be easily maintained in the future and is more efficient to create. One of the biggest benefits to working with a pre-processor is the ability to store items as variables that can be recalled later, for example if the same font was required in multiple parts of the website, then it can be stored under a name and used multiple times. Items can also be grouped together saving multiple lines of code being written out and further improving the performance of a website and reducing the uploaded file size. SASS is not the only pre-processor for CSS, one of the other options available is known as LESS which works in a similar way however only requres JavaScript files to run, whereas SASS is based on Ruby. SASS in its original form uses a different syntax to CSS, meaning that its written under the extension .SCSS. SCSS is the latest version of SASS and within this version standard CSS rules can be followed. To compile a SCSS file the use of the CLI is required however other optional programmes and plugins are available with the same outcome. An important feature of SASS is the ability to exclude components of bootstrap that havent been used on the webpage, greatly affecting loading times and therefore affecting the user experience by not having to load certain styles.

# JavaScript

JavaScript was first created in 1995 and is an object-oriented programming language, it is commonly used on the client side of the web browser, however it can also be run server side or anywhere that runs the JavaScript engine. Since its standardisation in 1997 by the European Computer Manufacturers Association (ECMA), JavaScript would evolve to have better support across various browsers, allowing for webpages to be displayed the same across the board. The language standard of JavaScript can also be known as ECMAScript, and this is what JavaScript language conforms to. The current version of ECMAScript currently is the 13th edition and notable changes to the new version include the addition of public and private class fields, top-level await and RegExp match indices. JavaScript code can be written directly into a HTML document using the <script> opening and closing tags, however an alternative method to include it within the HTML document is to create a new .js file and then link it using <script src=””> which helps with de-cluttering the main document, we can see this used within the project.

One important way JavaScript can work with HTML is that it can help developers integrate third-party API’s, this is important for the project because it means we can fetch very specific data that’s already been written elsewhere and display it within a different webpage. The fetch method is known to be asynchronous, this allows for other operations to be completed whilst waiting for the resource to arrive, when it has arrived a promise is returned and this resolves to a response object, as explained by McGrath (2020, p. 577). The data that the fetch command retrieves is written in JSON (JavaScript Object Notation) and this is structured in a way that describes the data in a simplistic form and as a JavaScript object, stored in arrays and key/value pairs. JSON support was added to ECMAScript in version 5 (2009).

# Responsive Web Design

As the Internet has evolved over time, so have the devices that we use to access it on. The options in how we view the internet are constantly changing, therefore it’s important to make sure the web page being created is accessible and viewable to everyone. One of the simplest ways to ensure website accessibility is with the addition of alt text. Alt text is short for alternative text, it allows a description to be added to an image, this is a useful feature because if a device is unable to view the chosen image, then a text alternative will appear describing the image. Alt text is also useful to accessibility because for visually impaired users the written alt text can be read aloud by screen reading software. Another benefit to adding a picture name or description means that it is better defined for SEO (search engine optimisation).

One of the most popular CSS frameworks is called Bootstrap. Currently on version 5, bootstrap allows for responsive website designs that make the transition to different viewports a lot simpler and easier for the developers. Ouellette (2022) describes Bootstrap as being a giant collection of handy, reusable bits of code written in HTML, CSS, and JavaScript. Some important Bootstrap components that were beneficial to the project include the use of navigation bars, dropdown menus, cards and also forms. These components allowed for better functionality of the website whilst the grid system supported the responsive design. One of the negative sides to using Bootstrap is how it can affect the performance of the website due to the fact that it contains large CSS files that are having to be loaded with the webpage. Bootstrap also isnt the only of its kind, there are various other different frameworks that all have their own positives and negatives, some of the alternatives include Bulma and Foundations, however due to the functionality with javascript and due to some of the key components required in the website, it was chosen to be the most advantageous for the project.

The two main design types to help webpages adjust to different sizes are Adaptive and Responsive. While Responsive design utilizes one layout and adjusts the content depending on the size, Adaptive design will have different fixed layouts that are created that adapt to the users screen size, as explained by Delaney (2020). Responsive Design is more commonly used over Adaptive design due to the shorter development time required when building a website, frameworks like Bootstraps grid system being implemented will mean that elements on the webpage will automatically move to different or new rows based on the current viewport. Other methods of producing responsive web design include the use of media queries, these are a new addition to CSS3 and allow the creator to make changes to styles depending of the viewport that’s been set as the max width. Media queries can also be used to detect how the user is accessing the site so its able to detect whether the user is using a mouse or a touchscreen and therefore changes can be made to assist accessibility. The main benefit of using a responsive design on the project is that multiple pages don’t need to be designed based on the device, whilst still achieving a mobile-friendly look, however Adaptive designs can be made to suit the specific requirements of the device, therefore in some circumstances offering a better user experience.

# References

Atkins Jr, T., Etemad, E. J. & Rivoal, F., (2022). *CSS Snapshot 2022.*   
Available at: <https://www.w3.org/TR/css-2022/> [Accessed: 20 November 2022].

Delaney, C., (2020). *Adaptive design vs responsive design.*   
Available at: <https://xd.adobe.com/ideas/process/ui-design/adaptive-design-vs-responsive-design/> [Accessed: 23 November 2022].

Hazeez, H., (2019). *The CSS Specification.*   
Available at: <https://dev.to/ziizium/the-css-specification-2k3c> [Accessed: 20 November 2022].

McGrath, M., (2020). *HTML, CSS and Javascript in Easy Steps.* s.l.:In Easy Steps Limited. (Page 577)

Ouellette, A., (2022). *What is bootstrap: A beginner's guide.*  
Available at: <https://careerfoundry.com/en/blog/web-development/what-is-bootstrap-a-beginners-guide/> [Accessed: 22 November 2022].

World Health Organisation, (2022). *Disability.*  
Available at: <https://www.who.int/news-room/fact-sheets/detail/disability-and-health#:~:text=An%20estimated%201.3%20billion%20people,earlier%20than%20those%20without%20disabilities>. [Accessed: 20 November 2022].

W3schools (2022) *HTML <meta> charset Attribute.*   
Available at: <https://www.w3schools.com/tags/att_meta_charset.asp> [Accessed: 21 November 2022].