

# BIT607 Web development

## Assessment 2

### Weighting

30%

### Learning outcomes

LO2 - Apply HCI principles to design and implement a web application using frameworks and techniques that focus on responsive design, user experience (UX), and the usability and accessibility of the application.

LO4 - Implement, evaluate and use a range of tools and techniques required for the development of a web application

### Instructions

Complete and submit your assessment according to the Open Polytechnic's [Assessments webpage](#). This includes information on academic integrity, word limits and referencing.

- Include your name, student number and the assessment number.
- Number your pages.

### Submission

- Submit your assessment in 5 files:
  - 1 x word processing document
  - 4 x wireframe image files
- Submit your work through your iQualify course.
- Emailed assessments will not be accepted.
- You will receive an automated notice following submission.

**By submitting your assessment, you confirm that it is your own, original work.**

# Introduction

Over your three assessments for BIT607 Web development, you will design and build a web application. Assessment 2 is based on the same project brief documents as BIT607

Assessment 1:

- Appendix 1 - Project brief
- Appendix 2 - Menu

In Assessment 2, you will complete three assessment tasks to:

- Plan and analyse how you will make your web application design responsive, usable, and accessible.
- Develop a responsive web application from the requirements and planning you completed for Assessment 1.
- Submit the code for your application.

## Task 1 – Design planning and analysis

Task 1 of Assessment 2 will use the goals, requirements and wireframes you gathered in Assessment 1.

**Note - Include your wireframes with your assessment (1 mark).**

Submit the four wireframes from Assessment 1 as clearly named image files. You can include any revisions or changes you've made to your design since submitting Assessment 1 if you wish. Your explanation can then refer to the images you've submitted.

### Part 1. Responsive design

- Explain three things your development work will include to ensure your application is mobile responsive.
- How would you test to see if this has been achieved?

### Part 2. Usability

- Explain three things your development work will include to ensure your application is usable.
- How would you test to see if this has been achieved?

### Part 3. Accessibility

- Explain three things your development work will include to ensure your application is accessible.
- How would you test to see if this has been achieved?

*(Word count guideline: 500 words)*

**(25 marks)**

## Task 2 - Develop a web application

Develop a web application locally that implements the wireframe and information architecture you defined in Assessment 1. We suggest that you use Visual Studio Code, but if you would like to use a different software, you can. You can include any revisions or changes you've made to your design since submitting Assessment 1 if you wish.

In Task 2 of this assessment, you will need to demonstrate your ability to implement, evaluate and use a range of tools and techniques required for the development of a web application.

At a minimum, ensure you have the following pages and content:

- home (image of restaurant)
- contact (map)
- hours (calendar)
- menu (food and drink with illustrative images)
- reservations (with a form to allow reservations to be taken).

For any dynamic content we suggest that you use Google maps, forms, and calendar, but if you prefer you can use another service.

Your completed web application should meet the following five requirements:

1. Use valid HTML5 to implement web page headers, footers, content and navigation between the web pages. Check your HTML code using a validation tool and provide screenshots of your use/results.
2. Formatting should be controlled from a separated and linked CSS file created using CSS3 standards.
3. Follow accessibility guidelines where appropriate. Consider:
  - Headings and alt text
  - Style and colour
  - ARIA
4. Apply responsive design principles to make the web application mobile-ready. Consider:
  - Design and user experience
  - Images
  - Text and font
5. Optimise page loading times with the aim that the home page can be loaded within 2 seconds on a 4G network. All other pages should have their performance optimised as much as possible using appropriate techniques. Submit a Google PageSpeed Insights screenshot for your home page showing the results for your application.

**(65 marks)**

## **Task 3 - Potential improvements for your web application**

### **Part 1. Improving performance**

Explain how HTTP caching and Content Delivery Networks could further improve load time.

### **Part 2. Adding to your design**

Reflect on what you might add to extend your application.

- Suggest two alterations you could make to your web application, and
- Explain how they would improve the functional and/or visual design.

**(10 marks)**

*(Word count guideline: 300 words)*

# Marking schedule

<b>Task 1, part 1.</b> <b>Relevant wireframes provided, 1 mark.</b>					
<b>Responsive design, 8 marks.</b>	<b>7 - 8</b>	<b>5.5 - 6.5</b>	<b>4 - 5</b>	<b>2.5 – 3.5</b>	<b>1 – 2</b>
<ul style="list-style-type: none"> <li>Explain three things your development work will include to ensure your application is mobile responsive.</li> <li>How would you test to see if this has been achieved?</li> </ul>	Identifies three development actions and explains how each action ensures your application is mobile responsive. Explanation is clearly written, refers to the wireframes and goals/requirements from the project brief and supporting HCI principles/ usability theory. Testing method is clearly and correctly described.	Identifies three development actions and explains how each action ensures your application is mobile responsive. Explanation is clearly written and refers to the wireframes. Testing method is described correctly.	Identifies three development actions and explains how each action ensures the application created is mobile responsive. Testing method is described correctly.	Identifies two or less development actions. Explanation of how each action relates to the mobile responsiveness of your application is unclear. Testing method is described only partially or is a poor choice for the stated action/s.	Identifies one or no development actions. Explanation not provided, or not clearly related to mobile responsiveness. Testing method is not described or is a poor choice for the stated action/s.
<b>Task 1, part 2.</b> <b>Usability, 8 marks.</b>	<b>7 – 8</b>	<b>5.5 – 6.5</b>	<b>4 – 5</b>	<b>2.5 – 3.5</b>	<b>1 - 2</b>
<ul style="list-style-type: none"> <li>Explain three things your development work will include to ensure your application is usable.</li> <li>How would you test to see if this has been achieved?</li> </ul>	Identifies three development actions and explains how each action ensures your application is usable. Explanation is clearly written, refers to the wireframes and goals/requirements from the project brief and supporting HCI/usability theory. Testing method is clearly and correctly described.	Identifies three development actions and explains how each action ensures your application is usable. Explanation is clearly written and refers to the wireframes. Testing method is described correctly.	Identifies three development actions and explains how each action ensures your application created is usable. Testing method is described correctly.	Identifies two or less development actions. Explanation of how each action relates to the usability of your web application is unclear. Testing method is described only partially or is a poor choice for the stated action/s.	Identifies one or no development actions. Explanation not provided, or not clearly related to usability. Testing method is not described or is a poor choice for the stated action/s.

<b>Task 1, part 3.</b> <b>Accessibility, 8 marks.</b>	<b>7 - 8</b>	<b>5.5 - 6.5</b>	<b>4 - 5</b>	<b>2.5 – 3.5</b>	<b>1 - 2</b>
<ul style="list-style-type: none"> <li>Explain three things your development work will include to ensure your application is accessible.</li> <li>How would you test to see if this has been achieved?</li> </ul>	Identifies three development actions and explains how each action ensures your application is accessible. Explanation is clearly written, refers to the wireframes and goals/requirements from the project brief and accessibility guidelines. Testing method is clearly and correctly described.	Identifies three development actions and explains how each action ensures your application is accessible. Explanation is clearly written and refers to the wireframes. Testing method is described correctly.	Identifies three development actions and explains how each action ensures your application created is accessible. Testing method is described correctly.	Identifies two or less development actions. Explanation of how each action relates to the accessibility of your web application is unclear. Testing method is described only partially or is a poor choice for the stated action/s.	Identifies one or no development actions. Explanation not provided, or not clearly related to accessibility. Testing method is not described or is a poor choice for the stated action/s.
<b>Task 2</b> <b>5 requirements, total 65 marks.</b>	<b>8 – 10 Marks</b>	<b>6.5 – 7.5 Marks</b>	<b>5 – 6 Marks</b>	<b>4 – 4.5 Marks</b>	<b>1 – 3.5 Marks</b>
<p>1. Use valid HTML5 to implement web page headers, footers, content and navigation between the web pages.</p> <p>Check your HTML code using a validation tool and provide screenshots of your use/results.</p>	<p>All HTML and CSS is valid across all sections of required pages, including headers, footers, content areas and navigation between pages.</p> <p>All of the HTML and CSS is correctly structured and formatted.</p>	<p>Almost all HTML and CSS is valid across all sections of required pages, including headers, footers, content areas and navigation between pages.</p> <p>There are only minor errors that have little or no impact on the overall functionality, accessibility and design of the application.</p> <p>Almost all of the HTML and CSS is correctly structured and formatted.</p>	<p>Most of the HTML and CSS is valid across sections of required pages, including headers, footers, content areas and navigation between pages.</p> <p>There are few errors that impact on the functionality, accessibility and/or design of the application.</p> <p>Most of the HTML and CSS is correctly structured and formatted.</p>	<p>Some of the HTML and CSS is valid across sections of required pages.</p> <p>There are many errors that impact on the functionality, accessibility and/or design of the application.</p> <p>Some of the HTML and CSS is correctly structured and formatted.</p>	<p>Some HTML and CSS is used but is largely not valid and contains errors that impact significantly on the overall functionality, accessibility and design of the application.</p> <p>Some of the HTML and CSS is correctly structured and formatted, but is generally inconsistent with HTML5.</p>

	4 – 5 Marks	3.5 Marks	2.5 – 3 Marks	2 Marks	1 – 1.5 Marks
	<p>Screenshots of the use of a code validator is provided for the 5 required pages:</p> <ul style="list-style-type: none"> <li>• home</li> <li>• contact</li> <li>• hours</li> <li>• menu</li> <li>• reservations</li> </ul>	<p>Screenshots of the use of a code validator is provided for 4 of the required pages:</p> <ul style="list-style-type: none"> <li>• home</li> <li>• contact</li> <li>• hours</li> <li>• menu</li> <li>• reservations</li> </ul>	<p>Screenshots of the use of a code validator is provided for 3 of the required pages:</p> <ul style="list-style-type: none"> <li>• home</li> <li>• contact</li> <li>• hours</li> <li>• menu</li> <li>• reservations</li> </ul>	<p>Screenshots of the use of a code validator is provided for 2 of the required pages:</p> <ul style="list-style-type: none"> <li>• home</li> <li>• contact</li> <li>• hours</li> <li>• menu</li> <li>• reservations</li> </ul>	<p>Screenshots of the use of a code validator is provided for 1 or none of the required pages:</p> <ul style="list-style-type: none"> <li>• home</li> <li>• contact</li> <li>• hours</li> <li>• menu</li> <li>• reservations</li> </ul>
2. Formatting should be controlled from a separated and linked CSS file created using CSS3 standards.	4 – 5 Marks	3.5 Marks	2.5 – 3 Marks	2 Marks	1 – 1.5 Marks
	All pages, and elements within those pages are well-formatted and styled according to good design principles.	Almost all pages and elements within those pages are well-formatted and styled according to good design principles.	Many pages and elements within those pages are well-formatted and styled according to good design principles.	Some pages and elements within those pages are well-formatted and styled to satisfactory design principles.	Very few pages and elements within those pages are formatted and styled to satisfactory design principles.
	8 – 10 Marks	6.5 – 7.5 Marks	5 – 6 Marks	4 – 4.5 Marks	1 – 3.5 Marks
	<p>All formatting is controlled correctly and, in all instances, applies best practice. Includes a linked CSS document.</p> <p>Includes an external CSS style sheet.</p> <p>Must not include any inline CSS. Font properties are correctly and completely provided.</p> <p>Layout is controlled using appropriate display, float and position properties.</p> <p>A clear demonstration of using the box model correctly throughout the application.</p>	<p>Almost all formatting is controlled correctly and mostly applies best practice. Includes an external CSS style sheet.</p> <p>Must not include any inline CSS. Font properties are correctly provided, but may not be complete.</p> <p>Most of the layout is controlled using appropriate display, float and position properties.</p> <p>The box model has been used throughout the application.</p>	<p>Most formatting is controlled correctly. Includes a linked CSS document – but has some CSS in places that do not adhere to best practice. Includes an external CSS style sheet.</p> <p>Must not include any inline CSS. Font properties are correctly provided, but may not be complete.</p> <p>Some of the layout is controlled using appropriate display, float and position properties.</p>	<p>Some formatting is controlled correctly. There are many places, however, where the CSS is out of place and does not adhere to best practice.</p> <p>Font properties are considered but not complete.</p> <p>No layout properties provided but it does not affect the display.</p> <p>Box model not used, but no adverse effects on the display.</p>	<p>There is some attempt to apply CSS, though controlled incorrectly.</p> <p>No font properties or layout properties are used. The lack of these affects the display.</p> <p>Box model not used, lack adversely effects the display.</p> <p>May have used tables for display.</p>

	Tables are not used for layout.	Tables are not used for layout.	At least one instance of the box model is used. Tables are not used for layout.	May have used tables for display.	
<b>3.</b> Follow accessibility guidelines where appropriate. Consider: <ul style="list-style-type: none"> <li>Headings and alt text</li> <li>Style and colour</li> <li>ARIA</li> </ul>	<b>4 – 5 Marks</b>	<b>3.5 Marks</b>	<b>2.5 – 3 Marks</b>	<b>2 Marks</b>	<b>1 – 1.5 Marks</b>
	The application has the most optimal level of accessibility in terms of its use of headings, forms and alt text. In all sections of the application there is proper use of headings for organising content and alt text is sufficiently detailed, making it highly accessible for the widest range of possible users.	The application has a high level of accessibility in terms of its use of headings, forms and alt text. In almost all sections of the application there is proper use of headings for organising content and alt text is sufficiently detailed, making it highly accessible for a wide range of possible users.	The application has a high level of accessibility in terms of its use of headings, forms and alt text. In many sections of the application there is proper use of headings for organising content and alt text is used, making it highly accessible for many possible users.	The application is somewhat accessible in terms of its use of headings, forms and/or alt text. Headings are used and/or alt text is provided. This makes it more accessible for some users, though some may not be able to use it due to a lack of accessibility that could otherwise be provided for through better use of headings and alt text.	The application is accessible in some areas where there has been an attempt to use headings, forms and/or alt text, though many may not be able to use it due to a lack of accessibility that could otherwise be provided for through better use of headings and alt text.
	<b>4 – 5 Marks</b>	<b>3.5 Marks</b>	<b>2.5 – 3 Marks</b>	<b>2 Marks</b>	<b>1 – 1.5 Marks</b>
	The application has the most optimal level of accessibility in terms of style (e.g., font type, size, margins, spacing) and use of colour, making it highly accessible for the widest range of possible users.	The application has a high level of accessibility in terms of style (e.g., font type, size, margins, spacing) and use of colour across all its pages making it highly accessible for a wide range of possible users.	The application has a high level of accessibility in terms of style (e.g., font type, size, margins, spacing) and use of colour across most of its pages, making it highly accessible for many possible users.	The application is somewhat accessible in terms of style (e.g., font type, size, margins, spacing) and use of colour across some of its pages, though some may not be able to use it due to a lack of accessibility that could otherwise be provided for through better use of style.	The application is accessible in some areas where style has been applied, though many may not be able to use it due to a lack of accessibility that could otherwise be provided for through better use of style.



	4 – 5 Marks	3.5 Marks	2.5 – 3 Marks	2 Marks	1 – 1.5 Marks
	The application has the most optimal level of accessibility in terms of the ability for a user to use it with a keyboard alone, and in a logical way. All pages adopt ARIA roles and landmarks to identify navigation menu, headers and the main content. All users who rely on a screen reader would easily understand all content presented on every page, and its layout.	The application has a high level of accessibility in terms of the ability for a user to use it with a keyboard alone, and in a logical way. Almost all items in pages adopt ARIA roles and landmarks to identify navigation menu, headers and the main content. Many users who rely on a screen reader would have no issue with understanding the main content on a page and its layout.	The application is largely accessible in terms of the ability for a user to use it with a keyboard alone, and in a logical way. Most items in pages adopt ARIA roles and landmarks to identify navigation menu, headers and the main content. Many users who rely on a screen reader would have no issue with understanding the main content on a page and its layout, though there are some pages they may find difficult to understand.	The application is somewhat accessible in terms of the ability for a user to use it with a keyboard alone. Some items in pages adopt ARIA roles and landmarks to identify navigation menu, headers and the main content. Many users who rely on a screen reader may struggle to interpret some of its important content and/or page layout.	The application is accessible in some areas. To a limited degree a user may be able to use it with a keyboard alone.
4. Apply responsive design principles to make the web application mobile-ready. Consider: <ul style="list-style-type: none"> <li>Design and user experience</li> <li>Images</li> <li>Text and font</li> </ul>	4 – 5 Marks	3.5 Marks	2.5 – 3 Marks	2 Marks	1 – 1.5 Marks
	<p>Viewport perfectly configured to allow browsers to adjust page dimensions and scaling to suit the device, so all pages can be easily resized by the user.</p> <p>Menu/navigation is suitably responsive and displays well on desktop and mobile screen sizes. Layout responds well to changing screen sizes (including header and footer).</p>	<p>Viewport well configured to allow browsers to adjust page dimensions and scaling to suit the device, so most pages can be easily resized by the user.</p> <p>Menu/navigation is mostly responsive and displays well on desktop and mobile screen sizes. Layout responds to changing screen sizes (including header and footer).</p>	<p>Viewport well configured in some areas to allow browsers to adjust page dimensions and scaling to suit the device, so most pages can be resized by the user.</p> <p>There is evidence that responsive design has been applied to menu and navigation/layout. Layout responds to changing screen sizes (including header and footer).</p>	<p>Viewport configured to allow browsers to adjust some page dimensions and scaling to suit the device. There are a few pages that can be resized by the user.</p> <p>Some evidence of responsive design techniques being applied. Part of the layout responds to changing screen sizes.</p>	<p>Viewport configured in some ways (though not accurately) to allow browsers to adjust at least one page's dimensions and scaling to suit the device.</p> <p>No evidence of responsive design techniques being applied.</p>

	<b>4 – 5 Marks</b>	<b>3.5 Marks</b>	<b>2.5 – 3 Marks</b>	<b>2 Marks</b>	<b>1 – 1.5 Marks</b>
	All images scale well, or alternative images provided for smaller viewports. There is no instance on any page where an image feels 'out of place' or designed for desktop.	Almost all images scale well. There may be a minor instance on a page where an image feels slightly 'out of place' or designed for desktop, but this does not impact on user experience.	Most images scale well. There may be a few instances on a page where an image feels 'out of place' or designed for desktop, but this has a minor impact on user experience.	Some images scale well. There are several instances where an image feels 'out of place' or designed for desktop, which has some impact on the user experience.	Attempt has been made to scale images, but on mobile devices they appear 'out of place' or designed for desktop only.
	<b>4 – 5 Marks</b>	<b>3.5 Marks</b>	<b>2.5 – 3 Marks</b>	<b>2 Marks</b>	<b>1 – 1.5 Marks</b>
	All text is legible for mobile visitors without any need for 'pinch and zoom'. Text scales properly within the viewport.	Almost all text is legible for mobile visitors without any need for 'pinch and zoom'. Text mostly scales properly within the viewport.	Most text is legible for mobile visitors without much need for 'pinch and zoom'. Text mostly scales properly within the viewport.	In some areas of the application text is legible for mobile visitors. User may need to 'pinch and zoom' in many cases.	Some attempt has been made to make text legible but user needs to 'pinch and zoom' to make text legible.
<b>5.</b> Optimise page loading times with the aim that the home page can be loaded within 2 seconds on a 4G network. All other pages should have their performance optimised as much as possible using appropriate techniques. Submit a Google PageSpeed Insights screenshot for your home page showing the results for your application.	<b>4 – 5 Marks</b>	<b>3.5 Marks</b>	<b>2.5 – 3 Marks</b>	<b>2 Marks</b>	<b>1 – 1.5 Marks</b>
	Google PageSpeed Insights screenshot provided for the home page of your application.  Home page loads within 2 seconds on a 4G network.	Google PageSpeed Insights screenshot provided for the home page of your application.  Home page loads within 3 seconds on a 4G network	Google PageSpeed Insights screenshot provided for the home page of your application. Home page loads within 4 seconds on a 4G network	Google PageSpeed Insights screenshot is not provided for the home page of your application, or the information is not clear.  Home page loads within 6 seconds on a 4G network.	Google PageSpeed Insights screenshot is not provided for the home page of your application.  Home page loads within 8 seconds on a 4G network.
<b>Task 3, part 1.</b> <b>Improving performance, 5 marks.</b>	<b>4 – 5 Marks</b>	<b>3.5 Marks</b>	<b>2.5 – 3 Marks</b>	<b>2 Marks</b>	<b>1 – 1.5 Marks</b>
Explain how HTTP caching and Content Delivery Networks could further improve load time.	Explains clearly, logically, and accurately how HTTP caching and Content Delivery Networks could further improve load time. Explains technical detail	Explains clearly, logically, and accurately how HTTP caching and Content Delivery Networks could further improve load time	Explains accurately how HTTP caching and Content Delivery Networks could further improve load time	Attempts to explain how HTTP caching and Content Delivery Networks could further improve load time but is not clear and/or parts are inaccurate.	Little or no attempt to explain how HTTP caching and Content Delivery Networks could further improve load time is made.

	with reference to appropriate standards/technology.				
<b>Task 3, part 2.</b> <b>Adding to your design, 5 marks.</b>	<b>4 – 5 Marks</b>	<b>3.5 Marks</b>	<b>2.5 – 3 Marks</b>	<b>2 Marks</b>	<b>1 – 1.5 Marks</b>
<p>Reflect on what you might add to extend your application.</p> <ul style="list-style-type: none"> <li>Suggest two alterations you could make to your web application, and</li> <li>Explain how they would improve the functional and/or visual design.</li> </ul>	<p>States two proposed alterations to your web application. Explains how each alteration improves the functional and/or visual design with reference to appropriate standards/technology.</p> <p>Explanation is written in a clear and logical style. All relevant technical details are provided and accurate.</p>	<p>States two proposed alterations to your web application. Explains how each alteration improves the functional and/or visual design.</p> <p>Explanation is written in a clear and logical style. Technical details provided are accurate.</p>	<p>States two proposed alterations to your web application. Explains how each alteration improves the functional and/or visual design.</p> <p>Technical details provided are accurate.</p>	<p>States two proposed alterations to your web application. Attempts to explain how each alteration improves the functional and/or visual design but is not clear and/or parts are inaccurate.</p>	<p>States one or no proposed alterations to your web application. Little or no attempt to explain how each alteration improves the functional and/or visual design is made.</p>