Programming Studio 1
COSC2803 | Semester 2 2024
Milestones 2, 3 & 4: Web Application

Assessment Type	Implementation, Usability Testing & Demonstration Group Assessment (pairs)
Due Date (M2)	11.59pm, Sunday 3 Nov 2024 (End of Week 8)
Due Date (M3)	11.59pm, Sunday 10 Nov 2024 (End of Week 9)
Demonstrations (M4)	Week 10, by Appointment
Silence Period (M2)	From 5.00pm, Friday 1 Nov 2024
Silence Period (M3 & M4)	From 5.00pm, Friday 8 Nov 2024
Weight	Milestone 2: N/A (checkpoint only) Milestone 3: 25% of the final course grade Milestone 4: 10% of the final course grade
Submission	Online, via Canvas. Submission instructions are provided on Canvas.
Learning Outcomes	This assignment contributes to CLOs: 1 - 8.

Overview

The studio project develops a web-based application to addressing Domestic Waste Management and Recycling. In Milestone 1 you designed and conceptualised your web-application based on a product idea that you were provided. In Milestones 2 & 3, you will develop your web-application, complete a usability test of your web-application, reflect on the feedback from test participants, and revise the implementation of your web-application. In Milestone 4 you will present and demonstrate your final web-application, showcasing the culmination of the skills and knowledge that you have learnt throughout the studio course. To complete these Milestones, you will need to progressively apply the skills and knowledge that you gain through Weeks 5 to 9, plus include the skills and knowledge that you gained previously in Weeks 1 to 4.

Group Work

You will continue working with the same team from Milestone 1, unless otherwise informed by course staff. You will continue to use the **team collaboration tools** from Milestone 1. In addition, you will use a GitHub repository linked to the provided GitHub classroom assessment for collaborating on your code.

You are required to use **team collaboration tools** as specific for this assessment. Teamwork conducted in other places may not be considered for grading. You will also be required to evaluate the contributions of your group partner.

You must divide the implementation so that each member of the group contributes to every level.

Specifically:

- Each person must *implement* one **LEVEL 1 (GREEN)** sub-task.
- Each person must *implement* one **LEVEL 2 (ORANGE)** sub-task.
- Each person must *implement* one **LEVEL 3 (RED)** sub-task.
- Each person must write *at least one* usability test.
- Each person must be a moderator for *at least one* usability test.

Your group should work together on some tasks, including:

- Implementing common Java coding elements shared across your sub-task(s).
- Optionally completing a *single* **LEVEL 4 (PURPLE)** extension task, described in Section 2.
- Refining the ER Model and Relational Schema of your *implemented* database.
- Creating a *proposed* 3NF ER Model of your database and showing the model in 3NF. Re-implementing your database to use the 3NF form is an extension task.
- Being an observer for usability testing.
- Creating and conducting the Milestone 4 presentation.

Social Challenge

You will continue to work on the "Domestic Waste Management and Recycling" Social Challenge. The Product Idea and Database Business Case provided in Milestone 1 are also used for Milestone 2-4.

Assessment Details

Milestones 2, 3 & 4 are integrated. Therefore, all these Milestones are described in this document. You should continue to refer to Challenge Requirement Document.

Milestone 2: Development & Usability Test Preparation

Milestone 2 is a progress update. You will complete a *partially functional implementation* of your web application and prepare this implementation for usability testing. In assessing your final project we will assess your usability testing, and review improvements you made between Milestones 2 and 3. We recommend that you complete the following by the **Milestone 2** deadline:

1. Fully implemented the **LEVEL 1 (GREEN)** sub-tasks.
2. Fully implemented the **LEVEL 2 (ORANGE)** sub-tasks.
3. Commenced implementation of the **LEVEL 3 (RED)** sub-tasks. This does not need to be fully functional but are demonstration pages, such that the pages:
    a. Have fully active web links that connect all the pages together.
    b. Mostly complete UI (HTML/CSS).
    c. Populate the web page with "dummy" or "simple" database queries.
4. Considered your implementation of the optional **LEVEL 4 (PURPLE)** extension task.

A key part of your development is to *refine* your UX/UI and ER Model (database) ideations from Milestone 1. Your Milestone 1 designs may not be perfect. Additionally, you will learn more concepts that you can integrate into your project throughout your coursework. Thus, as you complete your implementation, you should think about:

1. Refining your existing Personas or creating additional Personas that are better suited towards the requirements of your final website.
2. Devising Context scenario(s) and Key Path scenario(s).
3. Refining your ER Model to correct modelling issues.
4. The impacts of using more advanced SQL techniques on the design of your ER Model.

You should document your process as you refine your UX/UI and ER Model design. You must include as part of your **Milestone 3** submission:

- Personas of key users of your website.
- Context Scenario(s) relevant to the Personas.
- ER Diagram of your *implemented* database.
- Relational Schema of your *implemented* database.
- A 3NF normalised Relational Schema (assuming your implemented schema is not normalised).
- A set of functional dependencies used to justify that your design is in 3NF.

Usability Testing

In Week 9, you will have other students in the current cohort test your web application and provide feedback. Thus, you will need to prepare usability testing material, including:

1. A **Participant Information Form** (PIF).
2. At least **three (3) Personas** of your web application. You may need to devise *new* Personas that are different from your competitive analysis.
3. **One (1) Context Scenario for each Persona**. You will need to devise these Context scenarios as you develop your usability testing.
4. **One (1) task for each Persona** for the participants to complete with your web application:
    a. Each task must be tied to the Context Scenario for the Persona.
    b. You will need to transform the Context Scenarios into a Key Path scenario so that you can create the usability testing task plan (that is, the participant instructions).
5. A **Survey** of questions that you will ask of your participants once they complete their testing.

In Milestone 2, your team will submit all the preparation material listed above for usability testing.

In Milestone 3, your team will submit the results of your usability testing results and evidence that your participants agreed to the PIF.

During your Milestone 4 presentation your team will discuss the results of your usability testing.

Week 9 – Conducting the Usability Tests

In Week 9, you will conduct your usability testing during class and will be a participant in the usability testing of other teams. This process is outlined below:

1. You will group up with one/two other teams.
2. You will conduct the usability tests of *your* web application.
3. You will participate in the usability test of *another team's* web application. You will role-play one of the other team's Persona and complete the required task(s) to the best of your ability. You should complete the other team's survey as truthfully as possible.
4. At the end of the testing, you should have:
    a. Conducted *at least 2* usability tests for *your* web application.
    b. Participated in *at least 2* usability tests of *another team's* web application.

The usability testing process is very important. It's imperative that you provide **good feedback** to the other teams, so that everybody can make their web-applications as good as possible.

As part of completing Milestone 3, you **must make *at least ONE significant* change** to you web application based on the results of your usability testing. You must **redesign and re-implement** this ONE aspect. You will describe and justify the change that you make as part of your Milestone 4 presentation.

Proposing a 3NF Database Schema

As part of your Milestone 3 submission, and based on your knowledge from Week 8 material, you must ***propose*** a ***Database Schema*** of your ***implemented*** database that has been normalised into 3rd Normal Form (3NF). To show your database is in 3NF, you must include all functional dependencies that you have identified and used to justify the proposed database is in 3NF.

You ***are not required*** to implement this Database Schema (as it may require significant changes to your database). You are only required to propose what your database should be in 3NF.

Milestone 3: Complete Web Application

In Milestone 3 you will submit:

- Your **fully completed web application.** This web application must include:
    - Your Java project containing all code source files (such as files for Java code, HTML, CSS, images, README, pom.xml, etc.). Your web application must be able to be executed by the assessors from your submission.
    - Your SQLite Database (as used in the web application and stored in the database folder)
- A PDF document containing your final **Personas**.
- For you ***implemented*** **database**:
    - An ER Diagram (PDF) that represents the ER Model.
    - The Relational Database Schema (PDF).
- An Database Schema representing your ***proposed*** **database** that has been normalised into 3NF, including all functional dependencies showing that the model is 3NF.
- The results, completed PIFs, and any other supplementary material that was generated from conducting your **usability testing**.
- A teamwork contribution and peer review form (as a Microsoft Form).

Your *code submission* will be collected through GitHub Classrooms, using the GitHub Classroom Assessment associated with the link provided on Canvas for Milestone 2-4. Your code submission will be collected using the timestamp of the last commit *before* the due date. Instructions for late code submissions will be provided in Week 9.

Your work for Milestone 3 will be assessed during your Milestone 4 presentation. It will be assessed on:

- Levels (1-4) that you successfully implemented.
- Suitability of your UX/UI, including if your UX/UI:
    - Satisfies the needs & goals of relevant Personas through relevant Context Scenarios.
    - Satisfies Nielsen design heuristics.
    - Makes suitable use of UX/UI Design Patterns.
- Suitability of the ER Model and Relational Database Schema of your *implemented* database, including the:
    - Suitability of your ER Model, including appropriate use of attributes, entities, and cardinality and participation relations.
    - Accuracy of the representation of the ER Model in a Relational Database Schema.
    - Suitability of pre-processing the dataset for storage in the Relational Database Schema.
    - Suitability and Correctness of your SQL queries for extracting the relevant information to be displayed on your web application.
- Suitability of your Database Schema for your *proposed* database that has been normalised into 3NF, including the correctness of all functional dependencies showing the model is 3NF.
- Suitability and Correctness of your Java web program.

- Usability Testing, including:
    - Preparation of usability testing material, including PIFs, Personas, Tasks, Survey questions and all relevant material to be provided to the participants.
    - Relevance of the usability tests towards the Personas and Context Scenarios.
    - Suitability of the conduct of the usability tests.

Milestone 4: Presentation and Demonstration

In Milestone 4, you will present and demonstrate your group's project. The presentation will be **held in-person** and made to course staff. It's also open for other students to attend. The key question to answer in your presentation is "**why is your website (UX/UI & Database) *well designed*?"**.

Your presentation will be conducted in **Week 10** at a scheduled timeslot. Your presentation will be **15 minutes**. An additional 5 minutes may be used for questions.

You may structure your presentation as you wish. We recommend that you should:

1. Present how your web application satisfies the Milestone 2-3 marking criteria.
2. Present how your web application meets the requirements of Levels 1, 2, 3, and 4.
3. Present how the UX & UI of your web application:
    - Satisfies the needs & goals of the Personas.
    - Enables the Context Scenarios of the Personas.
    - Satisfies Nielsen design heuristics, including justifying any trade-offs.
    - Makes use of common design patterns.
4. Present how your *implemented* database:
    - Follows principles of ER modelling.
    - Enables the database to be queried using suitable SQL queries.
5. Present your *proposed* Database Schema has been normalised into 3NF.
6. Present at least one element of your design that you changed based on your usability testing:
    - The issue identified by users while completing their usability testing.
    - The change that addressed this issue.
7. Demonstrate a run-through of using your website for the scenarios that you devised.

You may use presentation tools of your choice including:

- A slide deck (such as in PowerPoint or Keynote).
- A web browser.
- VSCode to show the code (HTML, CSS, Java & SQL) of your program as necessary.

Your presentation will be assessed on:

- Its structure, the use of slides, diagrams, code examples, and other presentation aids.
- How well you are prepared.
- How well you cover the assessment criteria for Milestones 2-3.
- Whether you leave the assessors (and audience) with few questions.

Your teamwork ***across all*** Milestones 2-4 is included as part of the Milestone 4 marking criteria. You will be assessed on:

- Organisational skills of your group members.
- Contributions of your group members to the project.
- Communication of your group members during the project.
- Your evaluation of the teamwork of your group members

You are welcome to attend the presentations of the other students and support them. In the software industry you will regularly complete code reviews. Therefore, it's good to become comfortable with presenting your work to many other people.

More information on the scheduling of presentations will be provided closer to Week 10.

Extension Tasks (Level 4 tasks for HD grade)

Your group may select a *single* **LEVEL 4 (PURPLE)** extension task to complete. Only team members that have contributed to the extension and applied it to their subtask will attract level 4 grades. We have provided a list of suggestions. You may also *negotiate* an extension task with your cohort lead. Your extension should set your project apart from all other studio projects. This is your opportunity to impress us with your skills and knowledge. To qualify as an extension, it must be a single **significant** piece work that goes well beyond the requirements of Levels 1, 2 & 3. **You should confirm** with your cohort lead that your chosen task qualifies as an extension task by no later than Friday of Week 8.

Our provided list of extensions:

- Revisit your product idea from your competitive review. If your product idea would cater to significantly different users or contains significantly different task compared to the requirements document, as an extension you may add a section to your site that completes your completive review product idea. The key to this extension is "significantly different". You will need to justify this by showing:
    - Suitable Personas.
    - Suitable tasks and context scenarios that support the Personas' needs & goals.
- Significantly extend your website by researching and souring your own data within the context of the Social Challenge. You will need to update your ER model, and database implementation to support the new data set. You will also need to devise a suitable UX/UI to enable users to retrieve/query information from the new data set.
- Re-implement your database according to your *proposed* 3NF Database Schema. If your original ER Model is already in 3NF, then you cannot complete this extension.
- Make use of "advanced web tools" that are beyond the HTML & CSS techniques covered in the studio. These will require you to investigate methods of completing this type of work:
    - Allow users to save queries that can then be looked up by other users or that they can use again when they re-visit the website another time.
    - Dynamically generate graphs or figures.
    - Use Interactive Maps or graphs.
    - Create a mobile-friendly user experience and user interface.
    - Implement a consistent reactive UI through JavaScript and CSS libraries.

Teamwork Skills & Assessment of Teamwork

Teamwork is an important professional skill that you will continue to develop during the studio.

Teamwork Tools

In Milestones 2-4 you must continue to use the **Canvas Group Page** that was setup during Milestone 1[1]. In addition, you must use **a GitHub Repository (linked to the GitHub Classroom Assessment provided on Canvas)**, to share and manage your code with your group.

[1] If your group has been reallocated you must use your new Canvas Group Page for your reallocated group.

Teamwork Contribution

Each member of the group is required to contribute to each element of the assessment, and each element of the grading rubric. That is, at a minimum each team member should:

- Implement the UX/UI for their subtasks.
- Implement the SQLite database, including loading the of data to support their subtasks.
- Implement SQL queries for their subtasks.
- Prepare material for and conduct usability testing on their subtasks.
- Participate in the presentation and demonstration.

Git Repository, GitHub & GitHub Classroom

You must use a GitHub repository **linked to the GitHub Classroom Assessment provided on Canvas** to share and implement your code. Your code submission will **only** be collected from the provided GitHub Classroom Assessment. Repositories in other locations will not be accepted.

GitHub has a **100mb limit** on files stored within a repository. GitHub will not allow you to push commits containing oversized files. For this assessment, you must ensure all files (including the SQL database) are less than 100mb in size. The database can be stored within these limits. If you encounter issues with file size limits (including the database) consult the Milestone 2-4 FAQ which contains instructions on how to reduce the file size of your SQL Database and how to resolve Git Commit issues for file size limits.

Teamwork Contribution and Peer Review Form

All team members must individually complete the Teamwork Contribution and Peer Review Form for Millstones 2-4. The link to the form will be placed on the Canvas in Week 9. This form asks you to:

- Describe your teamwork contributions, and the date(s) on which you completed your teamwork.
- Review the teamwork of your group partner(s). This should be a fair and honest review of your partner(s) contributions, and how they collaborated with you over the course of Milestones 2-4.

Issues with Teamwork and Individual Grades

Ideally your teamwork will progress smoothly. Thus, the final grade that you will receive will reflect the quality of the entire studio project to which both team members contributed equally. If you have concerns about your teamwork, make sure you discuss these with the staff member allocated to your group **as soon as issues arise**. Do not leave this to the last minute.

However, if one member of the team doesn't sufficiently contribute, the assessor may award individual grades for one or more components of the rubric. The studio project has been structured so that each member of the team has tasks they can *individually complete*. Therefore, even if your team member's work in insufficient, *you* are expected to complete *your individually allocated tasks*.

Note that individual grading:

- Is the sole determination of the assessor. Students may provide explanations if they believe they should be individually assessed, however, the assessor makes the final determination.
- Still assesses the teamwork rubric component. Students are still assessed on their *teamwork performance*. Failure to make any concerted teamwork effort may result in a grade of zero for the teamwork component for either group member.

Submission

Follow the instructions on Canvas to complete your submission for the project for each Milestone.

Milestone 2 Submission

You will need to submit:

- Code (via GitHub Classrooms).
- Usability testing preparation material.

Milestone 3 Submission

You will need to submit:

- Code (via GitHub Classrooms).
- Revised Personas
- Results of your usability testing.
- Evidence of agreement to the PIFs of your usability testing participants.
- ER Diagram(s), Relational Schema(s), and Functional Dependencies.
- Teamwork Contribution Document and Peer Review Form.

Milestone 4 Submission

You will need to submit:

- Materials used for your presentation, such as your slide deck.

Assessment Declaration

When you submit work electronically, you agree to the RMIT assessment declaration.

Silence Period

For **Milestone 2**, a silence period will take effect from 5.00pm, Friday 1 Nov 2024.

For **Milestones 3 & 4**, a silence period will take effect from 5.00pm, Friday 8 Nov 2024.

This means questions about this assignment will be not answered, whether they are asked on the Canvas Discussion Board, by email, or in person. The silence period is in place because staff members cannot be available 24x7 to answer last minute questions about the assignment. Silence periods are also in place to avoid last minute panic and avoid confusion which cannot be resolved in a timely manner before the assessment due date. Make sure to allow plenty of time for your questions to be answered.

Late Submissions & Extensions

A penalty of 10% per day of the maximum grade is applied to late submissions up to 5 days, after which you will receive zero marks.

The course coordinator may grant short extensions up to 7 days. **You must apply for an extension *at least* 1 *business* day *before* the due date in accordance with RMIT Assessment Adjustment process.** However, extensions are not guaranteed and require suitable supporting documentation. The course coordinator may refer requests to Special Considerations. To apply for an extension, use the Assessment Extension Tool on Canvas. Instructions for the use of this tool are available on this linked PDF.

Special Consideration *may result in an equivalent assessment*, which may take the form of a timed assessment assessing the same knowledge and skills of the assignment and are generally granted on an individual basis. Generally, Equivalent Assessments will take place after the end of semester. For more information refer to the RMIT Special Consideration process.

Supported Software for Assessment and Grading

Only the software and resources listed on Canvas and used in Studio Classes/Workshops are used for the purpose of assessing the studio project. It is your (the student's) responsibility to ensure:

- Your Java program for your studio project can be fully compiled and executed using GitHub Codespaces. In the event of disputes, GitHub Codespaces will be used to assess your work.
- Your Java program for your studio project can be fully compiled and executed using only the VSCode setup (including extensions and Java libraries) as described on Canvas.
- If you make use of (as extension activities) any additional Java or web libraries, that you:
    - Receive confirmation from course staff that the use these libraries is permitted.
    - Ensure the use of these libraries comply with the project requirements.
    - Ensure you use the libraries in accordance with their License conditions.
- All SQL databases can be opened, read, and written to through SQLite and the JDBC library as described on Canvas.

Work that does not run using the supported course software may incurr grade penalties. If you have any concerns about software you are using, you must consult with course staff in a timely manner.

Marking Guidelines

Milestone 2

Milestone 2 is a progress update and preparation for usability testing.

Milestone 3

A total of twenty five (25) marks are available for this assignment. Assignment marks are divided across the following categories:

- UX & UI Implementation (5 marks)
- Database Modelling (5 marks)
- Database Implementation & Queries (5 marks)
- Java Programming (5 marks)
- Usability Testing (5 marks)

The detailed breakdown is provided on the marking Rubric available on Canvas.

Milestone 4

A total of ten (10) marks are available for this assignment. Assignment marks are divided across the following categories:

- Presentation Skills, Coverage & Questions (5 marks)
- Teamwork & Peer Assessment (5 marks)

The detailed breakdown is provided on the marking Rubric available on Canvas.

Academic Integrity and Plagiarism (Standard Warning)

Academic integrity is about the honest presentation of your academic work. It means acknowledging the work of others while developing your own insights, knowledge, and ideas. You should take extreme care that you have:

- Acknowledged the words, data, diagrams, models, frameworks and/or ideas of others that you have quoted (i.e. directly copied), summarised, paraphrased, discussed or mentioned in your assessment, using appropriate referencing methods.
- Included a reference list, giving the details of all publication details so your reader can locate the source, if necessary. This includes material from Internet sites. If you do not acknowledge the sources of your material, you may be accused of plagiarism because you have passed off the work and ideas of another person without appropriate referencing, as if they were your own.

RMIT University treats plagiarism as a very serious offence constituting misconduct. Plagiarism covers a variety of inappropriate behaviours, including:

- Failure to properly document a source.
- Using copyright material from the internet or databases.
- Collusion between students.

For further information on policies and procedures, refer to the RMIT Academic Integrity Website.

The penalty for plagiarised assignments includes zero marks for that assignment, or failure for this course. Please be aware that RMIT University uses plagiarism detection software.

Use of AI Tools in Assessment Tools in this assessment

The majority of your work in this assessment should be your own work, and not plagiarised from other sources, or sourced from the use of Artificial Intelligence (AI) tools. Therefore, **the use AI tools are restricted in certain ways for this assessment task.**

In this assessment task, you may use AI tools to support you in developing and completing your work by generating ideas, planning, and/or drafting only. Any use of such tools must be acknowledged and referenced.

Work that is significantly produced by AI tools, or where AI tools are used to complete this assessment without attribution may result in an allegation of academic misconduct.

If you are thinking of using AI tools for this assessment, please consider completing RMIT's AI module to ensure you avoid the risk of academic misconduct.