Programming Studio 1
COSC2803 | Semester 1 2023
Milestones 2, 3 & 4: Web Application

Assessment Type	Implementation, Usability Testing & Demonstration Group Assessment (pairs)
Due Date (M2)	11.59pm, Sunday 11 June 2023 (End of Week 8)
Due Date (M3)	11.59pm, Sunday 18 June 2023 (End of Week 9)
Demonstrations (M4)	Week 10, by Appointment
Silence Period (M2)	From 5.00pm, Friday 9 June 2023
Silence Period (M3 & M4)	From 5.00pm, Friday 16 June 2023
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.

1 Overview

The objective of the studio project is to develop a web-based application to address a **Social Challenge**. In Milestone 1 you will design and conceptualise your web-application based on a product idea that you are provided. In Milestones 2 & 3, you will develop your web-application, complete a usability test of your web-application, reflect on the feedback of your web-application 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. 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.

1.1 Group Work

You should 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 for collaborating on your code. You must continue to use the **team collaboration tools** that we set up for Milestone 1. For this semester you **must use this MS Team to coordinate and manage your group work**. You will also be required to **evaluate** the contributions of your group partner.

You should divide the implementation between your team like Milestone 1, so that each member of the group contributes an equal amount of work. 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 wo use the 3NF form is an extension task.
- Being an observer for usability testing.
- Creating and conducting the Milestone 4 presentation.

1.2 Social Challenge

You should continue to work on the same Social Challenge that you used in Milestone 1.

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2 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 for the sub-task descriptions.

2.1 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 (that is, testing by other people). In assessing your final project and demonstration 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. We noted in Milestone 1 that your first design won’t 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. Impacts of more using 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.

2.2 Usability Testing

In Week 9, you will have other students test your web application and provide feedback. Thus, you will need to prepare the material for your usability testing. Your usability testing material must include:

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, you will submit all your preparation material for your usability testing.

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

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

2.2.1 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 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 studio projects as good as possible.

As part of completing Milestone 3, you **must change at least one** part of your web application based on the results of your usability testing. We suggest that you **choose at least ONE issue** of your web application that the other students identified. You must **redesign and reimplement** this ONE aspect. You will describe and justify the change that you make as part of your Milestone 4 presentation.

2.3 Proposing a 3NF Database ER Model

As part of your Milestone 3 submission, and based on your knowledge from Week 8 material, you must ***propose*** an ER Model (in the form of an ER Diagram) 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 ER Model (as it may require significant changes to your database). You are only required to propose what your database should be in 3NF.

2.4 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 ER Diagram (PDF) representing the ER Model for your ***proposed*** **database** that has been normalised into 3NF, including all functional dependencies showing the model is 3NF.
- The results, completed PIFs, and any other supplementary material that was generated from conducting your **usability testing**.
- Your teamwork peer review (as a Microsoft Form).
- Teamwork Contribution Document (XLSX).

Your *code submission* will be collected through GitHub Classrooms. The other material will be submitted on Canvas, and your *teamwork peer review* will be completed by a MS Form.

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 ER Model 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.

2.5 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 "**how does your website achieve the goal of 'addressing the social challenge?'"**.

Your presentation will be conducted in **Week 10** at a scheduled timeslot. Your presentation should 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* ER Model for your database that 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.

Included as part of the Milestone 4 marking criteria, you will be assessed on the Quality of your Teamwork, across Milestones 2-4. 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.

2.6 Extension Tasks (Level 4 tasks)

Your group may select a *single* **LEVEL 4 (PURPLE)** extension task to complete. 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 your 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 ER Model. 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.

3 Teamwork Skills & Assessment of Teamwork

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

3.1 Teamwork Tools

In Milestones 2-4 you should continue to use the **private MS Team** that was setup during Milestone 1. In addition, you must use **a GitHub Repository (linked to the course GitHub Classroom)**, to share and manage your code with your group. We recommend that:

- You schedule regular meetings (every 2-3 days) in your private MS Team. This sets aside dedicated times for both group members:
  - Update each other on their progress.
  - Work together on aspects of the project.
- Review the Weekly Outline on Canvas, for a suggestion of how to allocate your time.

3.2 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.

To record each team member's contributions, you will submit a **teamwork contribution document** that outlines work of each team member. The contribution document template is linked on Canvas.

3.3 GitHub Repository & GitHub Classroom

You will use a GitHub repository to share and implement your code. This repository will be linked to the course GitHub Classroom. The GitHub Classroom link will be provided on Canvas.

3.4 Teamwork Peer Assessment

You must complete a peer review of the teamwork of your group partner(s) over the course of Milestones 2-4. The link to the review form will be placed on the Canvas in Week 9. This should be a fair and honest assessment of your partner(s) contributions to the studio project, and how they collaborated with you over the course of Milestones 2-4.

3.5 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.

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4 Submission

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

4.1 Milestone 2 Submission

You will need to submit:

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

4.2 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 Diagrams, Relational Schema, and Functional Dependencies.
- Teamwork Contribution Document and Teamwork Peer Review.

4.3 Milestone 4 Submission

You will need to submit:

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

4.4 Assessment Declaration

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

4.5 Silence Period

For **Milestone 2**, a silence period will take effect from 5.00pm, Friday 9 June 2023.

For **Milestones 3 & 4**, a silence period will take effect from 5.00pm, Friday 16 June 2023.

This means questions about this assignment will be not answered, whether they are asked on MS Teams, by email, or in person. The silence period is in place because staff members are generally unavailable over the weekend. Make sure to allow plenty of time for your questions to be answered.

4.6 Late Submissions & Extensions

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

Short extensions may be granted by the course coordinator up to 1 business day *before* the due date in accordance with RMIT Assessment Adjustment process. However, extensions are not guaranteed and require suitable documentation. The course coordinator may refer requests to Special Considerations.

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. For more information refer to the RMIT Special Consideration process.

4.7 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:
    - Inform course staff before using these libraries.
    - Ensure the use of these libraries comply with the project requirements.
    - Ensure you use the libraries in accordance with their License conditions.
    - Receive confirmation from course staff that the use these libraries is permitted.
- 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 result in grade penalties. If you have any concerns about software you are using, you must consult with course staff in a timely manner.

5 Marking Guidelines

5.1 Milestone 2

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

5.2 Milestone 3

The marks are divided into the following categories:

- UX & UI Implementation 5/15
- Database Modelling 5/15
- Database Implementation & Queries 5/15
- Java Programming 5/25
- Usability Testing 5/25

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

5.3 Milestone 4

The marks are divided into the following categories:

- Presentation Skills, Coverage & Questions 5/10
- Teamwork & Peer Assessment 5/10

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

6 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 words, data, diagrams, models, frameworks and/or ideas of others you have quoted (i.e., directly copied), summarised, paraphrased, discussed or mentioned in your assessment through the appropriate referencing methods
- Provided a reference list of the publication details so your reader can locate the source if necessary. This includes material taken 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
- Copyright material from the internet or databases
- Collusion between students

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

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

6.1 Use of Artificial Intelligence (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.