ICT711 Programming and Algorithms T225

Assessment 4

Java application – Individual Assignment

Value: 35%

Due Date: 17th September 2025 Wednesday Week 12

Overview

In this individual project, you will enhance the medium-sized Member Management System (MMS) application developed in Assessment 3 by implementing both a Graphical User Interface (GUI) and a Text-Based Interface (TBI), allowing users to choose their preferred mode of interaction. This GUI should provide an intuitive and user-friendly way for users to interact with the system while retaining the functionality of the text-based interface.
Additionally, the application must incorporate sorting and searching algorithms to manage and retrieve data efficiently. You are required to apply appropriate testing techniques to validate the functionality, efficiency, and performance of the application. A detailed report must be submitted, outlining your design choices, testing approach, encountered challenges, and solutions implemented. This assessment contributes to learning outcomes a, b, c and d.

On successful completion of this individual project, you should have demonstrated that you are able to:

- Extend your group project application (medium-sized Member Management System (MMS) for a gym that allows the gym admin to manage members, their personal details, their monthly performance (whether they are able to achieve their fitness goals for that month or not), and their monthly fee details - by introducing a GUI based interface
- Allow users to choose their preferred mode of interaction – GUI or text based
- GUI should provide an intuitive and user-friendly way for users to interact with the system while retaining the functionality of the text-based interface
- Demonstrate effective integration of GUI components with the application's underlying logic
- Ensure that the application handles user input and file operations effectively in both interface modes
- Provide meaningful feedback to users through appropriate dialogs and messages in the GUI
- Incorporate sorting and searching algorithms in your application to manage and retrieve data efficiently
- Provide an insightful discussion on algorithm complexity, suggesting improvements

Overall, the GUI interface must give option to the user for all operations such as add, delete, query and add search / sort features.

You need to submit your work on Moodle.

Please remember to submit a single PDF report only, having a cover page, and a table of content. Please use figure captions and numbers. Please use references.

In general, for the report, you should use code/ output snippets along with meaningful captions and figure numbers to demonstrate your work in the report.

The report should include:

- Project Overview (System description, objectives, key features)
- User Interface Implementation (Details on GUI and text-based interface design)
- System Architecture (Class diagrams, design patterns used)
- Sorting & Searching Implementation (Algorithms applied and their justification)
- Thorough and insightful discussion on algorithm complexity and how to improve it
- Testing & Debugging (Test cases, expected vs. actual results, debugging logs)
- Reflection (Challenges faced, problem-solving approach, and lessons learned)
- All source code - Well-structured Java program with appropriate comments and documentation should be provided as appendix
- A link to all source files separately (a link to a cloud storage where the source code (working project with all necessary files) is located).
- A link to recorded demonstration video (if did not present in class in week-12)

The rubric requires you to demonstrate the project in week-12. You have the choice of presenting it to the class / lecturer during week-12 lecture in person, or record a 5-minute video demonstration and include the link at the end of the report before submitting it.