MBIS402 Programming Fundamentals and Techniques

Assessment Overview	
Assessment	**AT2 Group Project Implementation Report and Presentation**
Mark	**40 Marks** (28 marks for report, 10 marks for presentation, and 2 marks for peer and self-evaluation)
Due Date	Report: 11.55 pm Friday, Week 11 Presentation: In the class in Weeks 12
Submission method	Via the assignment drop box on eLearning
Submission format	PDF file (.pdf) or Word (.doc) only for the **report** PDF file (.pdf) or Word (.doc) only for **peer and self-evaluation form** PDF file (.pdf) or PowerPoint (.ppt) only for the **presentation** One submission only per group for the report One submission only per group for the presentation but every student must participate in the presentation in class Individual submissions are required for the peer and self-evaluation form
Other Requirements	For the report: Use 12 pt font Word limit: 3000 Words Double-space your document to allow room for feedback State your name and student number in the document header State the word count in the document header Include a bibliography Comply with the APA referencing style Every group member must also complete and separately submit a formal group work peer and self-evaluation form **For the presentation**: You will present to the class at an allocated time during the lecture and tutorial. You must submit any slides or graphics at the same time as your report.

Assessment Details
▪ In groups of 3 or 4, you will develop a working program for a given problem/scenario. Your group will design and develop a working program and ensure that it is tested to meet the requirements. A report (3000 words) documenting the design details, test plan, and test data and results should also be submitted. You are also to submit individual sections on critical analysis and reflection of the processes. You are also required to present your prototype in class for 10 – 15 minutes.
Marking Criteria
▪ Refer to the marking rubric below
Can I Use Generative Artificial Intelligence for this Assessment?
You may use generative AI tools such as ChatGPT or Microsoft Co Pilot **ONLY** to research and brainstorm ideas and approaches for completing your reflection. Please make sure to properly acknowledge any use of generative AI using CIM APA Referencing Guide.

Case Scenario: Comprehensive Library Management System Using Python

Learning Objectives:

- Interpret and design suitable algorithmic solutions to computing problems according to specific requirements and develop programs, debug, and test them.
- Apply problem-solving, design thinking, and decision-making methodologies in new contexts or to novel problems, source data from multiple sources, and manipulate data for analysis and visualisation.
- Research and formulate maintainable and reusable software solutions using the object-oriented programming paradigm.

Assessment Task:

The City Library has been facing challenges with its outdated management system. The current system hampers efficient book inventories, member records, and transaction management. To address these issues, the City Library requires a modern Library Management System (LMS) to streamline operations.

Challenges with the Current System:

- Slow data processing and retrieval due to obsolete information systems.
- Inefficiencies in managing book inventories, resulting in errors and delays.
- Lack of a centralised, secure electronic system for managing member records.
- Difficulty in tracking book loans and returns, leading to resource mismanagement.
- Absence of robust analytics and reporting features for data-driven decision-making.

Requirements for Library Management System

Add Book Record: Librarians should be able to add new book records to the library management system. Each book record should include essential information such as title, author, ISBN, and publication date.

Display Book Records: The system should enable users to view a comprehensive list of all book records within the library. Book records should be well-organised, showcasing titles, authors, ISBNs, and publication dates.

Search Book Record: Librarians should be able to search for a book record using the book's title or ISBN. The search functionality should be case-insensitive and provide accurate results for matching records.

Remove Book Records: Librarians should be able to remove a book record from the library management system using the book's title or ISBN.

Issue Book: The system should allow librarians to issue a book to a library member, recording the member's details and the date of issue.

Return Book: The system should enable librarians to record the return of a book, updating the member's record and the book's availability.

Generate Reports: The system should provide comprehensive reports on book inventories, issued books, and member activities.

Data Persistence: The system should store books and member records persistently, saving the data to a secure file for future reference. Upon system startup, it should read the data from the file to restore the library's records.

These requirements are designed to ensure efficient book and member data management, transaction tracking, and data persistence in the Library Management System.

Objectives of the Library Management System

Book Inventory Management: The system should store book details in CSV files. Identify appropriate attributes that define the book data. Store the details of members in CSV. Identify the attributes of members. There should be at least FIVE attributes for books and members.

Transaction Management: Implement functionalities to issue and return books, ensuring accurate tracking of transactions.

Billing and Financial Management: Implement a system to manage any fines or fees associated with overdue books. Utilise Object Oriented Programming (OOP) principles to model billing entities and ensure accurate financial transactions.

Reporting and Analytics: Create a robust reporting system that provides insights into book inventories, loan trends, and member activities. Implement graphical representations to present the results in a visually appealing format.

Your assessment task is to develop a Python program and write a comprehensive report (minimum 3000 words) documenting the design details, test plan, test data, and results.

REPORT STRUCTURE AND CONTENTS:

Cover Page – Use the provided cover page template to fill in your details such as the title of your assessment, your name, your student ID, the unit's name, and the unit code. There must be no graphics or pictures of any kind on the cover page.

Executive Summary - Provide 'No more than one page' of summary.

Table of Contents - Auto-generated using the word processor.

Introduction

- Briefly introduce the purpose of the Systems and their significance in managing data efficiently.
- Provide an overview of the objectives of the report.

Design Details

- Discuss the overall designs and architecture of the Systems.
- Describe the key data structures and data management methods used in the programs.
- Explain the rationale behind the chosen design decisions.

Algorithmic Solutions and Implementation

- Present algorithmic solutions for adding, displaying, searching, and removing books from the library.
- Provide the Python code implementation for each functionality with detailed explanations.
- Discuss the strategies used to handle edge cases and possible errors.

Object-Oriented Programming (OOP) Paradigm

- Explain how the programs are designed using the object-oriented programming paradigm.
- Discuss the concepts of classes, objects, encapsulation, inheritance, and polymorphism utilized in the programs.

Test Plan

- Define the test plan for each functionality of each program.
- Outline the test cases, including input data and expected outcomes.
- Discuss the criteria for determining the success of each test case.

Test Data and Results

- Provide the test data used to validate the programs.
- Document the results of each test case, highlighting successful tests and any identified issues or bugs.

Problem-Solving and Decision-Making Methodologies

- Reflect on the problem-solving and decision-making approaches used during the development of these programs.
- Discuss the challenges encountered and the strategies employed to overcome them.

Data Manipulation, Analysis, and Visualisation

- Explain the data sources used (e.g., input from users, etc.) and how the programs process and display the information.

Critical Analysis

- Evaluate the strengths and weaknesses of each program.
- Discuss potential areas of improvement and future enhancements.

Reflection

- Reflect on the learning objectives achieved throughout the project.
- Discuss how the development of the Library Management System improved problem-solving, decision-making, and algorithmic skills.
- Describe the experience of working on the project and how it contributed to personal and professional growth.

Conclusion

- Summarise the key findings and lessons learned from the project.
- Reiterate the significance of the Library Management System in managing book data effectively.

References

List all the sources, libraries, or frameworks used in the project.

Note: The above outline provides a general structure for the report. Students should elaborate on each section, providing detailed explanations, code snippets, and illustrations as needed to demonstrate their understanding and implementation of each of the programs. Additionally, students should ensure that the report meets the specified word count (3000) and adheres to proper academic standards for citation and referencing.

Presentation Guidelines:

The presentations delivered on **week 12** should include background, analysis, and findings from your information system analysis:

- The slides should be designed to be clear and have visual graphics, around 15 high-quality slides are enough.
- You should upload your final PPT in Moodle before your presentation day, as your lecturer will download and open it for your presentation. You cannot modify or re-upload any PPT, so be careful when uploading.
- Your presentation will be a summary of your report.
- Each member of the group should contribute to this project, and your lecturer will assess

your contributions and assign different marks accordingly.

- Each member of the group is expected to present the project. Failure to present will lead to zero marks for the presentation.
- Each group will get 15 minutes for the presentation.
- You should wear appropriate presentation attire, either smart casual or formal business.

Peer and Self-Evaluation Form Guidelines:

- A peer evaluation form is uploaded in Moodle under the AT2 assessment task. Each member should download it, fill out Parts A and B, and re-upload it to Moodle.
- The purpose of this form is to provide constructive feedback that can help improve team dynamics and individual performance in future group projects.
- Peer evaluations should prioritise fairness and professionalism, taking into account the influence of each member's contributions to the group project.

Rubric for AT2 Group Project Implementation Report and Presentation

	Fail (0 – 49)	Pass (50 – 64)	Credit (65 – 74)	Distinction (75 – 84)	High Distinction (85 – 100)
Depth and credibility of research	You have not demonstrated that you have conducted sufficient research (eg insufficient references to credible research or peer-reviewed academic literature), and/or you have relied on doubtful sources	You have demonstrated that you have conducted enough research (eg based on the number of references to credible research and/or peer-reviewed academic literature), and you have relied on credible sources	The depth and credibility of your research is above average (based on the number and quality of your sources)	The depth and credibility of your research is very good (based on the number and quality of your sources)	The depth and credibility of your research is exceptional (based on the number and quality of your sources)
Understanding of the challenge in terms of theories and concepts studied in this course	You have not adequately understood the challenge in terms of the theories and concepts studied (eg because you have used terminology incorrectly or your design/prototype is based on theoretically/conceptually incorrect assumptions or you have misconceived the issue/problem)	You have understood the challenge in terms of the theories and concepts studied (eg because you have correctly used terminology and your design/prototype is based on theoretically/conceptually correct assumptions)	You have understood the challenge in terms of the theories and concepts studied to an above average standard	You have understood the challenge in terms of the theories and concepts studied to an very good standard	You have understood the challenge in terms of the theories and concepts studied to an exceptional standard
Coherence of analysis justifying design/prototype	The rationale for your design/prototype is illogical and/or poorly reasoned (eg because it relies on unfounded assumptions or misunderstands the theories and concepts applied)	The rationale for your design/prototype is mostly logical and well-reasoned	The rationale for your design/prototype is logical and well-reasoned to an above average standard	The rationale for your design/prototype is logical and well-reasoned to a very good standard	The rationale for your design/prototype is logical and well-reasoned to an exceptional standard
Support for design/prototype	Your design/prototype is insufficiently supported by theory and/or evidence	Your design/prototype is supported by theory and/or evidence	Your design/prototype is supported by theory and/or evidence to an above average standard	Your design/prototype is supported by theory and/or evidence to a very good standard	Your design/prototype is supported by theory and/or evidence to an exceptional standard
Creativity	Your design/prototype lacks creativity	Your design/prototype is appropriately creative, whether in substance or format	Your design/prototype is appropriately creative to an above average standard	Your design/prototype is appropriately creative to a very good standard	Your design/prototype is appropriately creative to an exceptional standard

(for supporting document) Use of a commercially appropriate document structure (eg 'design challenge,' 'proposed solution,' 'justification for design/prototype')	Your supporting document is not structured in a commercially appropriate manner (eg lacking relevant headings)	Your supporting document is well structured in a commercially appropriate manner (eg using relevant headings)	Your supporting document is well structured in a commercially appropriate manner to an above average standard	Your supporting document is well structured in a commercially appropriate manner to a very high standard	Your supporting document is well structured in a commercially appropriate manner to an exceptional standard
Use of academically appropriate document style, writing style and referencing system	You have not used an academically appropriate writing style and/or referencing system (eg you have used colloquialisms or overly formal language or failed to use a recognised referencing system eg APA or Harvard)	You have used an academically appropriate writing style and referencing system	You have used an academically appropriate writing style and referencing system to an above average standard	You have used an academically appropriate writing style and referencing system to a very high standard	You have used an academically appropriate writing style and referencing system to an exceptionally high standard
Effectiveness of written and visual communication	Your written or visual communication is poor	Your written and visual communication is easy to follow	Your written and visual communication is clear and succinct to an above average standard	Your written and visual communication is clear and succinct to a very high standard	Your written and visual communication is clear and succinct to an exceptionally high standard
Clarity of presentation	Your presentation was not clear (eg because it was difficult to follow your argument, your props or diagrams were unnecessary or difficult to follow, or you did not pronounce your words well)	Your presentation was sufficiently clear to your intended audience (of business professionals) (eg because it was easy to follow your argument, your props or diagrams were relevant, and you spoke clearly)	Your presentation was clear to an **above average** standard	Your presentation was clear to a **very high** standard	Your presentation was clear to an **exceptional** standard
Depth of knowledge of presenter	You did not demonstrate that you possessed enough knowledge of the subject matter of the presentation (eg because of the language you used, because of your answers to unrehearsed questions or because of the examples you gave)	You demonstrated enough depth of knowledge of the subject matter of the presentation (eg because of the language you used, your answers to unrehearsed questions or the examples you gave)	You demonstrated knowledge of the subject matter of the presentation to an **above average** standard	You demonstrated knowledge of the subject matter of the presentation to a **very high** standard	You demonstrated knowledge of the subject matter of the presentation to an **exceptional** standard
Level of audience engagement	You failed to engage your audience (eg because you failed to create opportunities for audience engagement, dressed inappropriately or started/finished the presentation late)	You sufficiently engaged your audience (eg because you created opportunities for audience engagement, dressed appropriately and started/finished on time)	You sufficiently engaged your audience to an **above average** standard	You sufficiently engaged your audience to a **very high** standard	You sufficiently engaged your audience to an **exceptional** standard
Completion of formal peer and self- evaluation	You failed to complete the formal peer and self-evaluation form or failed to complete it adequately (eg because your comments were brief or genuine)	You completed the formal and self-evaluation form to a satisfactory standard (eg because your comments were thoughtful and genuine)	You completed the formal peer and self- evaluation to an above average standard	You completed the formal peer and self-evaluation to a very high standard	You completed the formal peer and self-evaluation to an exceptional standard

Your contribution to the group assessment task (as assessed by reference to peer and self-evaluation and your lecturer's observations)	Your contribution to the group task was below the expected standard (eg in terms of time on task, academic rigour of contribution, cooperation with others or keeping to agreed deadlines etc)	You contributed to the group task to a sufficient standard (eg in terms of time on task, academic rigour of contribution, cooperation with others, keeping to agreed deadlines etc)	You contributed to the group task to an above average standard	You contributed to the group task to a very high standard	You contributed to the group task to an exceptionally high standard