Project

Deadline: Sunday 15/5/2024 @ 23:59

**[Total Mark is 14]**

***Object Oriented Programming***

***CS230***

**Instructions:**

* You must submit two separate copies **(one Word file and one PDF file)** using the Assignment Template on Blackboard via the allocated folder. These files **must not be in compressed format**.
* It is your responsibility to check and make sure that you have uploaded both the correct files.
* Zero mark will be given if you try to bypass the SafeAssign (e.g. misspell words, remove spaces between words, hide characters, use different character sets, convert text into image or languages other than English or any kind of manipulation).
* Email submission will not be accepted.
* You are advised to make your work clear and well-presented. This includes filling your information on the cover page.
* You must use this template, failing which will result in zero mark.
* You MUST show all your work, and text must not be converted into an image, unless specified otherwise by the question.
* Late submission will result in ZERO mark.
* The work should be your own, copying from students or other resources will result in ZERO mark.
* Use **Times New Roman** font for all your answers.

Student Details: CRN:

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| **Name:**  **Name:**  **Name:**  **Name:** |  | **ID:**  **ID:**  **ID:**  **ID:** |
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# Description and Instructions

*Learning Outcome(s): CLO4*

Develop a program based on specification using programming language elements including syntax, data types, conditional statement, control structures, procedures and arrays, objects and classes

CLO5

Demonstrate Integrated Development Environment (IDE) for the editing, building, debugging, and testing of programs

**Project Instructions**

This project enables the students to integrate the covered knowledge and skills in this course.

* **Total Marks = 14**
* Group Size = 3- 4 members.
* **Submit all files:** **Project Report** (Word and PDF) on blackboard before 15th May 2024. Marks will be given based on your submission and quality of the contents.
* Each group must come up with a unique solution for the project based on the below description.
* Implement the Simple Library Management System according to the requirements provided.
* Write a Java program to demonstrate the functionality of the system.
* Include comments in your code to explain the purpose of each class, method, and important code block.
* Test your program with different scenarios to ensure that it works as expected.

**Project Title: Library Management System**

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CLO5

Demonstrate Integrated Development Environment (IDE) for the editing, building, debugging, and testing of programs

**Description:** You are tasked with developing a Library Management System in Java. The system should allow librarians to manage the library's collection of books and assist clients in borrowing and returning books. Additionally, clients should be able to search for books by title or author.

**Requirements:**

1. **Book Class:**

Create a Book class with the following attributes:

* title (String): The title of the book.
* author (String): The author of the book.
* available (boolean): The availability status of the book (true if available, false if borrowed).
* Implement appropriate getter and setter methods for each attribute.

1. **Library Class:**

Create a Library class to manage the library's collection of books. Include methods to:

* Add a new book to the library.
* Display a list of available books.
* Allow clients to borrow books.
* Allow clients to return books.
* Search for books by title or author.

1. **User Interface:**

* Implement a simple command-line interface (CLI) for librarians and clients to interact with the system.
* Provide menu options for librarians to perform actions such as adding books, displaying available books, searching for books, borrowing books, and returning books.
* Allow clients to search for books by title or author.

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1. **Sample Data:**

* Add at least three sample books to the library's collection during initialization.

1. **Functionality:**

* When a client borrows a book, update the book's availability status to reflect that it is no longer available.
* When a client returns a book, update the book's availability status to reflect that it is available again.
* Implement search functionality to allow clients to search for books by title or author.

1. **Error Handling:**

* Implement basic error handling to handle cases such as invalid input and book availability checks.

1. **Testing:**

* Test the functionality of the system by performing various actions such as adding books, searching for books, borrowing books, and returning books. (Include screen-shots of your output)