Instructions:

1. This is a group work (4 -5 students). But the evaluation will be individual.

2. **Warning:** Plagiarism will be given zero (0) mark without prior notice.

3. You will be given zero(0) marks if you do not submit on time. You are given ample time to submit earlier.

3. Submit only one zip folder with the file names as StudentID-StudentName.zip. The zip folder should contain all the source code, UML use case diagram, UML class diagram, and UML sequence diagrams.

4. You will need to attend a physical interview session between 9 – 19 July 2024 (pls reserve your calendar, do not go back home early and ask for online interview session. The interview will be physical at my office) where the instructor will ask questions about the work you have done. Information about the interview session time slot booking will be informed later by your lecturer. If you don't have a mic. Please get a mic ready! The session will be recorded.

5. **Read the marking rubrics so that you know how to score your marks!**

6**. The project is to be done using Java Swing only.**

7. For the interview, prepare yourself in the flow of the rubric given below.

8. If you submit the assignment but did not come for the interview. You will get Zero.

Question:

Client Requirements:

I need a standalone Graphical User Interface (GUI) application that can keep track of Multimedia University (MMU)'s participants/students' enrollments. Participants can take remedial (e.g. English remedial course, Mathematics remedial course, etc.), matriculation (Engineering, IT, Business, Law), undergraduate (Engineering, IT,

Business, Law), and/or postgraduate (Engineering, IT, Business, Law) courses and in future can be expanded to certificates and professional courses. Participants can take courses the traditional way one after another (e.g. undergraduate course followed by postgraduate course). But the university recently introduced a unique financing program where participants can stack several courses together (e.g. during enrollment, the participants can stack up matriculation, undergraduate, and postgraduate to get promotional rate when they move on to the next level).   Currently the seniority levels of the program are as follows:

Level 1: Remedial courses, Matriculation

Level 2: Undergraduate

Level 3: Postgraduate

Participants/students moving from one level to another level in the stacked scheme will be entitled to a 10% discount on the overall fees of the next course. This discount rate is subject to be changed in the future.

With the aim of increasing enrollment (and funnel of enrollments for future courses), the university may produce new innovative financing packages to attract more participants. The program design must be nimble such that any financing strategy can be easily deployed without needing to redesign the program.

There will also be other fees such as accommodation fee, IT/Network fee, Library fee, Club and Society fee. Only accommodation fee is optional, and the rest is mandatory and will be automatically added to the billing.

We then will issue a bill listing all the ordered courses with a sum to pay. The application needs to show the price before discount, the discount amount, and the net payable after discount (if any).

I also need an easy to navigate user interface which is user friendly and attractive.

Questions:

The questions below are based on the client requirements above. If you made any assumptions, please state your assumptions clearly. Justify your assumptions (if any).

1. Draw UML diagrams such as **use case diagram, a complete class diagram, and sequence diagrams** for the requirement above. Make sure you use the correct UML symbols.

2. Apply at least **one design pattern** in your design. Reflect it in the complete class diagram (as done in question 1). Pick design pattern from the following: Composite, Adapter, Bridge, Façade, Iterator, Observer, Builder, Prototype, Singleton. You must justify why you picked the design pattern. Do not use any other design patterns.

3. Implement a **Java Swing GUI program** for the design as per question 1 and 2. You need to have event handling and interactions. **Also make sure the UML diagram design and the coding are coherent.**

Marking Rubrics:

Criteria	Score and Descriptors					Weight (%)	Marks
	Good (10)	**Above Average (8)**	**Average (6)**	**Below Average (4)**	**Poor (2)**		
Program compilation	Program compiles without errors and warnings	Program compiles without errors but has got warnings	Program compiles with a single error	Program compiles with few errors (2 - 5)	Program compiles with many errors (more than 5)	10	
Feature fulfillment	**Features required:** 1. **Able to add courses individually or stacked up.** 2. **Mandatory fees are added automatically, optional fees added when required** 3. **Able to apply discount for stacked courses (if any)** 4. **Show course fee, mandatory fees, optional fee, total amount, discounts, and net payable** If fulfilled all 4 features → 20 marks If fulfilled 3 features → 15 marks If fulfilled 2 features → 10 marks If fulfilled 1 feature → 5 marks If none fulfilled → 0 mark					20	
UML Diagram fulfillment	If the UML use case is correct → 5 marks If the UML class diagram is correct → 5 marks If the UML sequence diagrams correct → 5 marks ** partial marks 2.5 can be awarded if needed.					15	
Design Pattern usage	If design pattern used and explained correctly --> 10 marks If design pattern usage has missing parts --> 5 marks No design pattern used/or wrong usage --> 0 mark					10	
If the application future proof?	if the UML class diagram design shows evidence of using correct Object-Oriented concepts/ design principles/ design pattern to make it future proof → 15 marks If the solution presented has got minor issues --> 10 marks If the solution presented has got major issues → 5 marks					15	

	No solution provided/ wrong solution --> 0 mark						
Able to answer interviewer random question(s)	The answer is correct, complete, and elaborated with correct terms used	The answer is correct, complete, but very briefly answered.	The is correct in general but with some mistakes in the explanation.	The answer is very vague.	The answer is wrong	30	
					TOTAL	**100**	

Sir, wants - database?

he the implementation workable?