Final Assignment

TCP2201 Object Oriented Analysis and Design

Total Marks: 40%

Due Date: 16 June 2023, 5pm (a firm due date; no extension)

Instructions:

1. This is an individual work. The project should be done solely by you!

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 an online interview session between 19 – 30 June 2023 (pls reserve your calendar) 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. The interview will be done at my room and will be recorded using google meet. If you don't have a mic. Please get a mic ready!

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. DO NOT use ChatGPT or any other artificial intelligence (AI) tools to do this assignment. If you are found using it or altering the answers from AI tools, you will get ZERO.

Question:

Client Requirements:

I need a standalone Graphical User Interface (GUI) Java Swing application that can keep track of mini-grocery sales. Customers will typically buy Fresh Produce like meat, vegetables, and fruits, and edibles like canned Foods and drinks. We then will issue a bill listing all the brought items with a sum to pay. Occasionally/Optionally my grocery store will run promotions and customers need to present us a royalty card (and its number) to get 5% discount. This discount will be applicable to the total

purchase. The application needs to show price before discount, the discount amount, and the net payable after discount (if any). We normally don't offer any other discount amounts besides the 5% discount. But in future we may offer bundled discount (e.g. we give discounts only if you buy coke and chicken). If bundled discount is applied then there will not be additional discount on the total bill. The application needs to be easy to extend if I want this feature later.

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 correct UML symbols.
2. Apply **one design pattern** in your design. Reflect it in the complete class diagram (as done in question 1). Pick one design pattern from the following: Composite, Adapter, Bridge, Façade, Iterator, Observer, Builder, Prototype, Singleton. You must justify why you picked the design pattern.
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 fresh produce to the bill 2. Able to add edibles to the bill 3. Able to apply discount coupons (if any) 4. Show 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 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 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 No solution provided/ wrong solution --> 0 mark					15	
Able to answer interviewer random question #1	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	10	
Able to answer interviewer random question #2	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	10	
Able to answer interviewer random question #3	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	10	
					TOTAL	100	