Assignment 1

Overview

You are required to design and develop a small Java console application. Completion of this assignment requires an understanding of:

- Analysis and design techniques, including development of use cases and UML diagrams –specifically, use case diagrams, class diagrams and sequence diagrams
- Object-oriented programming, focusing on polymorphism and the use of interfaces

Timelines and Expectations

Percentage Value of Task: 30%

Due: @ 11:59 PM on 23rd November 2021

Minimum time expectation: 20 hours

Learning Outcomes Assessed

The following course learning outcomes are assessed by completing this assessment:

- Understand the significance of detailed project planning and control, good communication and documentation and the use of appropriate tools to provide a quality product
- Understand the distinction between software engineering and programming, and thus thedistinction between a software configuration and a program
- Understand the methods and techniques involved in designing, implementing, and maintainingan information system using an object-oriented approach
- Demonstrate skills in designing and implementing an information system.

Assessment Details

A new party plan company (which sells any product of your choice) is opening in Australia. This company operates on a membership structure, offering discounts on the recommended retail price of product purchases based on a tiered membership approach:

Membership Level	Discount on Product Purchases
Member	6%
Bronze Member	10%
Silver Member	13.5%
Gold Member	19%
Platinum Member	25%

You have agreed to design and develop a small Java console program for this company, with four menu options.

Option 1: Create a member. The member needs to have a name and a membership tier.
Option 2: Make a purchase. Select a member who is making a purchase, enter the total recommended retail valueof that purchase and calculate the corresponding discounted price.

Option 3: Display a summary of transaction data for the current session, showing:

- The total number of sales processed, and the payment amount received for these sales
- The total number of sales processed for each membership tier, the payment amount received for each tierand the total discount given at each membership tier.

Option 4: Exit the system

After completing any of the first three options, the program returns to the menu so the user can select another option. After selecting the fourth option, the program closes. There is no need for the program data to persist once the program has closed.

The party plan company wants to be able to add additional membership tiers at a later date, so the system needs to be flexible. This means you will need to use an interface for processing payments, and polymorphism for the various membership classes, so that new, different levels of membership may be added at a later date with minimalupdates to the code. The company has also asked that you provide them with some documentation before you commence coding, so that they are able to verify that the program you intend to code will address their requirements. They would like to see use cases to summarize the requirements in written format, as well as use case diagrams, class diagrams and sequence diagrams.

Submission

You are required to submit the assignment before the due date consisting of:

- A Zip file containing the following (submitted via Moodle under the Assignment 1 link)
  <Given Name>_<Family Name>_StudentID.zip (e.g., Tess_Aims_30331856.zip)
  - A written report comprising:
    - Use Cases summarizing the requirements
    - UML Diagrams, created in Enterprise Architect, comprising:
      - a Use Case Diagram for processing a hire agreement
      - a Class Diagram of the intended system
      - a Sequence Diagram for processing a hire agreement for a member.
    - A short reflection (approximately 200-300 words) discussing the importance of requirements design and analysis, UML diagrams and object-oriented programming with interfaces and polymorphism. As an example, if you found that you changed your initial UML diagrams after you had commenced coding, you should explain what these changes were and explain what you learntthat led to these changes.
  - Enterprise Architect file(s) containing your UML Diagrams for the Use Case, Class and Sequence Diagrams
  - Your finished Java program, addressing the requirements outlined in the Assignment Details.

Marking Criteria/Rubric

Task	Available Marks	Student Mark
Requirements Analysis and Design		
• Use Cases summarizing the requirements of the program	4	
• A Use Case Diagram for processing a purchase by a member	4	
• A Class Diagram of the intended system	4	
• A Sequence Diagram for processing a member's purchase	4	
Development of Code A complete Java program addressing the requirements outlined in the Assignment Details section of this specification, including:		
• Functionality to create members at each of the membership tiers	5	
• Functionality to process purchases for each of the membership levels, including display of the correct discounted purchase price for that member	5	
• A progressive payments menu option that displays the total number of sales processed and the payment amount received for these sales, the total number of sales processed for each membership tier, the payment amount received for each tier and the total discount given at each membership tier.	4	
• Code demonstrating the use of an interface and polymorphism to handle discounts and the various membership options available	10	
Reflection on Learning		
• A short reflection (approximately 200-300 words) discussing the importance of requirements design and analysis, UML diagrams and object-oriented programming with interfaces and polymorphism.	5	
Total	45	

Feedback

Feedback is available in labs and by arrangement of consultation times. Marks will be uploaded in fdlGrades, and a complete marking sheet will be provided in Moodle **within two weeks from the submission date**.

Plagiarism

This is an individual assignment. You are not to attempt this assignment (or any part thereof) in conjunction with any other parties. All work handed in for marking should be your own and any help received should be explicitly acknowledged.

It is important to learn from the work of others and you are encouraged to explore the library, World Wide Web resources and have discussions with other students. However, work for assessment must be entirely your own work.

Plagiarism is the presentation of the expressed thought or work of another person as though it is one's own without properly acknowledging that person. You must not allow other students to copy your work and must take care to safeguard against this happening. More information about the plagiarism policy and procedure for the university can be found at http://federation.edu.au/students/learning-and-study/online-help-with/plagiarism

Federation University

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