

1. i. What is the most important difference between **generic software product development** and custom software development? (06 marks)
- ii. List three (03) essential attributes of good software. (06 marks)
- iii Briefly explain the importance of using coding standards and guidelines in software development? (08 marks)

(Total: 20 marks)

2. i. Define the terms functional requirements and non-functional requirements. (08 marks)
- ii. **AliExpress** is an e-commerce platform used for buying and selling products. (08 marks)
Identify and two (02) functional requirements and two (02) non-functional requirements for **AliExpress**

- iii Consider an online shopping system, based on the following scenario: (20 marks)
- Web customers can be either registered or new.
 - Registered customers can view items in the shop.
 - (Registered customers can search for items, browse the catalog, view items recommended for them, and add items to the shopping cart or wish list)
 - Viewing recommended items and adding to the wish list require customer authentication.
 - Items can be added to the shopping cart without authentication.
 - Registered customers can purchase items by proceeding to checkout.
 - During checkout, customer authentication is required, either through login, a 'remember me' cookie, or single sign-on.
 - Web authentication services are used in all use cases requiring authentication, while sign-on requires an external identity provider
 - For checkout, customers can finalize payment via credit card (through an external payment service) or PayPal.

Draw a Use Case diagram to capture above software requirements by identifying relevant actors, use cases and possible relations among them. Use associations, generalization (ISA), extend, and include relationships as appropriate.

(Total: 36 marks)

3.

Given the following UML class diagram in **Figure 1**, write a complete Java programs based on the instruction given below.

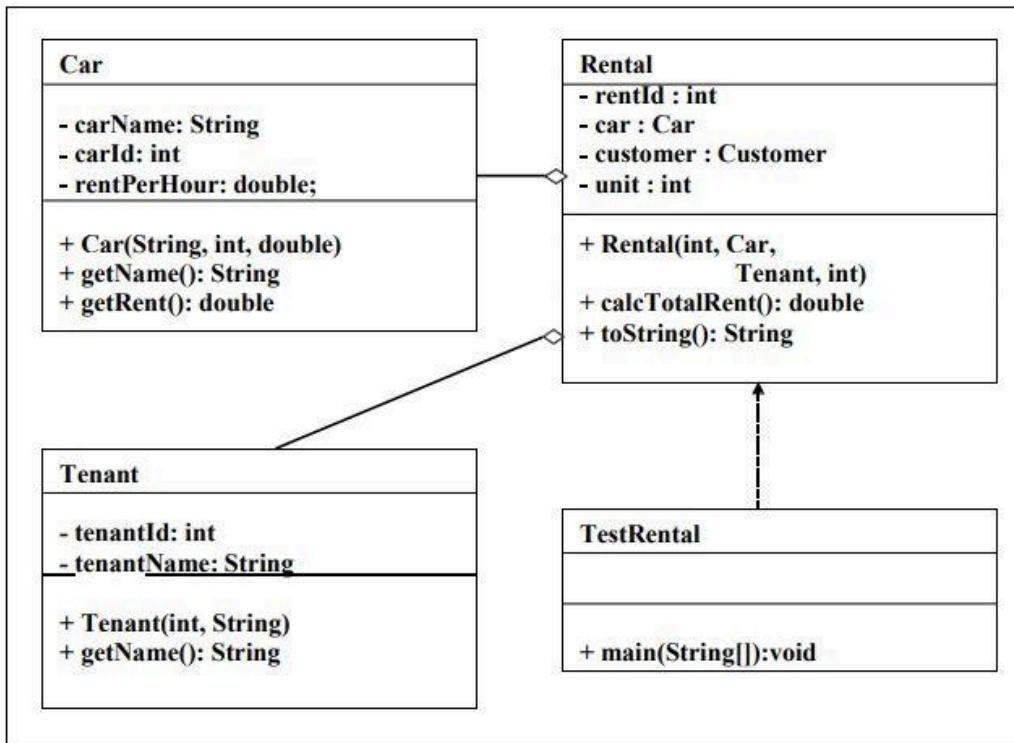


Figure 1: UML class diagram

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- c) Write a class **Rental** with the following methods: [16 Marks]

- Write constructor for class **Rental** that initializes `rentId`, `tenant`, `car` and `hour` instance variables through parameter passing.
- Write method `calcTotalRent()` which able to return the total value of car rent times with hour.
- Write method `toString()` which creates a string of rental information.

- d) Write a class **TestRental** that only has `main()` method with the following codes: [17 Marks]

- Create three (3) objects of class **Car** using the constructor with the specified information as shown in Table 1.
- Create three (3) objects of class **Tenant** using the constructor with the specified information as shown in Table 2.
- Create a Vector or ArrayList object named `rental` to store the created objects of class **Rental** with the specified information as shown in Table 3.
- Use the `for` loop to print the list of rentals using `toString()` method. The program should produce the output as shown in **Figure 2**.

Table 1

Object Name	Car Id	Car Name	Rent (Per hour)
car1	231	Estima	150.00
car2	345	Vios	80.00
car3	654	Viva	50.00

Table 2

Object Name	Tenant Id	Tenant Name
tenant1	90	Raihana
tenant2	91	Boo Lee
tenant3	95	Sita A/P Roki

Table 3

Rental Id	Tenant	Car	Rental Duration (in Hour)
1	tenant1	car1	2
2	tenant2	car2	4
3	tenant3	car3	5

List of rentals :

```

Rental: 1
Tenant: Raihana
Car: Estima
Hours: 2
Rental per Hour:
150.0
Total rental: 300.0

Rental: 2
Tenant: Boo Lee
Car: Vios
Hours: 4
Rental per Hour: 80.0
Total rental: 320.0

Rental: 3
Tenant: Sita A/P Roki
Car: Viva
Hours: 5
Rental per Hour: 50.0
Total rental: 250.0

```

Figure 2 : Output of the program