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1) Create a class named Student. Include the following protected member variables.

name, id, age, grade, address

Include appropriate getters and setters

Include a default constructor and a 5-argument constructor. The order of arguments in the 5-argument constructor is name, id, age, grade and address.

Include the following public methods in the Student class.

void display()

Display the details of the student.

boolean isPassed()

A student is said to have passed if his/her grade is above 50. This method returns true if the student has passed.

Create a subclass of Student named UGStudent .

Include the following private member variables.

degree

stream

Include appropriate getters / setters

Include a default constructor and a 7-argument constructor. The order of arguments in the 7-argument constructor is name, id, age, grade, address, degree and stream.

Include the following public methods in the UGStudent class.

void display()

Display the details of the ug student in the format as specified in the output.

boolean isPassed()

A ug student is said to have passed if his/her grade is above 70. This method returns true if the student has passed.

Create another subclass of Student named PGStudent .

Include the following private member variables.

specialization

noOfPapersPublished

Include appropriate getters / setters

Include a default constructor and a 7-argument constructor. The order of arguments in the 7-argument constructor is name, id, age, grade, address, specialization and number of papers published.

Include the following public methods in the PGStudent class.

void display()

Display the details of the pg student in the format as specified in the output.

boolean isPassed()

A pg student is said to have passed if his/her grade is above 70 and if he/she has published atleast 2 papers. This method returns true if the student has passed.

Create a class called Main to test the above classes.

output:

```
PROBLEMS  OUTPUT  DEBUG CONSOLE  TERMINAL  PORTS

PS C:\Users\vijay.m\Documents\java training> javac Main.java
PS C:\Users\vijay.m\Documents\java training> java Main
Student Details:
Name: Alice
ID: 101
Age: 20
Grade: 65.5
Address: 123 Main St
Passed: true

UG Student Details:
Name: Bob
ID: 102
Age: 21
Grade: 80.0
Address: 456 Oak St
Degree: BSc
Stream: Computer Science
Passed: true

PG Student Details:
Name: Charlie
ID: 103
Age: 24
Grade: 75.0
Address: 789 Pine St
Specialization: AI
Number of Papers Published: 3
Passed: true
PS C:\Users\vijay.m\Documents\java training> |
```

2) The task is to get the details of the vehicle and display the details using a menu driven application.

Write a Java program to Implement this task.

Create a class Vehicle

Include the following protected data members / attributes:

make – of type String

vehicleNumber – of type String

fuelType – of type String

fuelCapacity - of type Integer

cc – of type Integer

Include the following public methods

Create a constructor that initializes all the data members --- public Vehicle(String make,String vehicleNumber,String fuelType,Integer fuelCapacity,Integer cc)

displayMake – Display the make of the vehicle

"displayBasicInfo" – display basic information of the vehicle.

"displayDetailInfo" – An empty method.

Create a class TwoWheeler that extends Vehicle

kickStartAvailable – of type Boolean.

"displayDetailInfo" – displays the availability of kick start.

Create a class FourWheeler that extends Vehicle

audioSystem – of type String.

numberOfDoors – of type Integer.

"displayDetailInfo" - displays the audio system and number of doors.

displayDetailInfo - overridden method

Include getter setters for all the classes.

Create a main class to test the classes defined above.

```
--- Vehicle Management Menu ---
1. Create Two Wheeler
2. Create Four Wheeler
3. Display Vehicle Details
4. Exit
Choose an option: 3
No vehicle created yet.

--- Vehicle Management Menu ---
1. Create Two Wheeler
2. Create Four Wheeler
3. Display Vehicle Details
4. Exit
Choose an option: 1
Enter Make: honda
Enter Vehicle Number: 12345
Enter Fuel Type: petrol
Enter Fuel Capacity: 5
Enter CC: 150
Is Kick Start Available (true/false): true

--- Vehicle Management Menu ---
1. Create Two Wheeler
2. Create Four Wheeler
3. Display Vehicle Details
4. Exit
Choose an option: █
```

```
--- Vehicle Management Menu ---
1. Create Two Wheeler
2. Create Four Wheeler
3. Display Vehicle Details
4. Exit
Choose an option: 3
Make: honda
Vehicle Number: 12345
Fuel Type: petrol
Fuel Capacity: 5 liters
CC: 150
Kick Start Available: Yes

--- Vehicle Management Menu ---
1. Create Two Wheeler
2. Create Four Wheeler
3. Display Vehicle Details
4. Exit
█
```

```

--- Vehicle Management Menu ---
1. Create Two Wheeler
2. Create Four Wheeler
3. Display Vehicle Details
4. Exit
Choose an option: 2
Enter Make: maruthi
Enter Vehicle Number: 123456
Enter Fuel Type: desel
Enter Fuel Capacity:
5
Enter CC: 180
Enter Audio System: mp3
Enter Number of Doors: 3

--- Vehicle Management Menu ---
1. Create Two Wheeler
2. Create Four Wheeler
3. Display Vehicle Details
4. Exit
Choose an option: 

```

3. Create a class Shape and inherit three classes Square, Triangle and Rectangle. Implement the method double calculateArea() in Shape class and override the method in the subclasses. Use runtime polymorphism to call the calculateArea() method.

```

PS C:\Users\vijay.m\Documents\java training\bike\shape> java Main
Area of Square: 25.0
Area of Triangle: 12.0
Area of Rectangle: 28.0
PS C:\Users\vijay.m\Documents\java training\bike\shape> 

```

4. A Company provides an initial training for all its employees, once they join the company. During the training phase they call the employees as "Associate". The initial training is conducted for 60 days for each Associate. In these 60 days they learn various technologies. The first 20 days they learn "Core skills", the next 20 days they learn "Advanced modules" and the final 20 days they go to the "Project phase". Help the Company to find in which phase the associates are in.

Create a class Associate with associateId(int), associateName(String), workStatus(String).

Include getters and setters and constructors.

Add a method trackAssociateStatus

- This method takes the number of days as argument and sets the work status of the associate based on the number of days. If the number of days is greater than 60 days then set the work status as "Deployed in project".

In the Main class, create an object for the Associate class; Get the details assign the value for its attributes using the setters. Invoke the trackAssociateStatus method and find the work status and display the details.

```
PS C:\Users\vijay.m\Documents\java training\bike\shape\associate> java
Enter Associate ID: 1001
Enter Associate Name: xyz
Enter the number of days of training completed: 10
Associate ID: 1001
Associate Name: xyz
Work Status: Learning Core skills
PS C:\Users\vijay.m\Documents\java training\bike\shape\associate> |
```