Session-3 Lab Set=7

Assignment

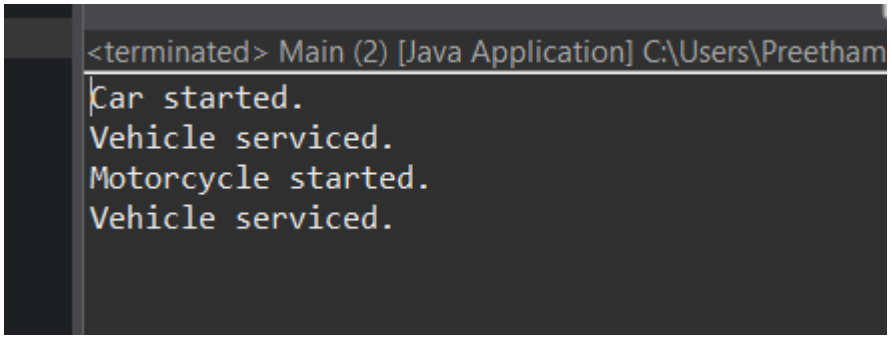
1. Create a base class called Vehicle with the following methods:

- void start (): This method should print "Vehicle started." Create two subclasses of Vehicle called Car and Motorcycle. Override the start() method in each subclass to provide a specific implementation:

- Car: Print "Car started."

- Motorcycle: Print "Motorcycle started." Create a class called Garage with a method named serviceVehicle (Vehicle vehicle). Inside this method, call the start () method of the provided vehicle object and print "Vehicle serviced." In the Main class, create instances of Car and Motorcycle. Create an instance of the Garage class. Call the serviceVehicle () method of the Garage class with instances of both Car and Motorcycle

Output



Source code

Vehicle.java

```java
package anudip.java.lab.vehicledemo;

public class Vehicle {
    void start() {
        System.out.println("Vehicle started.");
    }
}
```

Car.java

```java
package anudip.java.lab.vehicledemo;

public class Car extends Vehicle {
    @Override
    void start() {
        System.out.println("Car started.");
    }
}
```

Motorcycle.java

```java
package anudip.java.lab.vehicledemo;

public class Motorcycle extends Vehicle {
    @Override
    void start() {
        System.out.println("Motorcycle started.");
    }
}
```

Garage.java

```java
package anudip.java.lab.vehicledemo;

public class Garage {
    void serviceVehicle(Vehicle vehicle) {
        vehicle.start();
        System.out.println("Vehicle serviced.");
    }
}
```

Main.java

```java
package anudip.java.lab.vehicledemo;

public class Main {
    public static void main(String[] args) {
        Vehicle myCar = new Car();
        Vehicle myMotorcycle = new Motorcycle();
        Garage myGarage = new Garage();
        myGarage.serviceVehicle(myCar);
        myGarage.serviceVehicle(myMotorcycle);
    }
}
```

2. Create a class called Student. Inside the Student class, implement the following instance variables (fields):

- String name
- int age
- String department Implement the following constructors in the Student class:
- A default constructor that initializes the name to "Unknown", age to 20, and department to "Unassigned".
- A constructor that takes two parameters: name and age, and initializes the department to "IT".
- A constructor that takes three parameters: name, age, and department. In the Main class, create instances of the Student class using each constructor. Printoutthedetailsofeachstudent, includingtheirname, age, and department.

Source code

*Student.java *Main.java

```java
package anudip.java.lab;

public class Student {
    // Instance variables
    String name;
    int age;
    String department;

    // Default constructor
    public Student() {
        this.name = "Unknown";
        this.age = 20;
        this.department = "Unassigned";
    }

    // Constructor with name and age, department defaults to "IT"
    public Student(String name, int age) {
        this.name = name;
        this.age = age;
        this.department = "IT";
    }

    // Constructor with name, age, and department
    public Student(String name, int age, String department) {
        this.name = name;
        this.age = age;
        this.department = department;
    }

    // Method to print student details
    public void printDetails() {
        System.out.println("Name: " + name + ", Age: " + age + ", Department: " + department);
    }
}
```

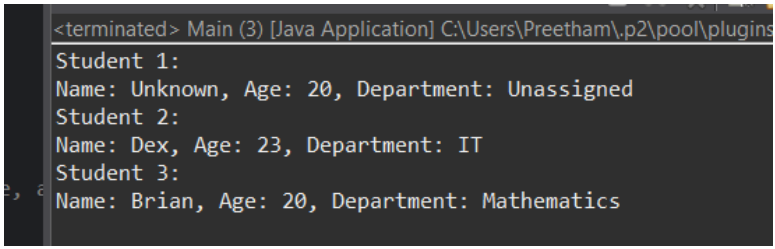
Student.java *Main.java

```java
package anudip.java.lab;

public class Main {
    public static void main(String[] args) {
        // Creating instances of Student using each constructor
        Student student1 = new Student(); // Default constructor
        Student student2 = new Student("Dex", 23); // Constructor with name and age
        Student student3 = new Student("Brian", 20, "Mathematics"); // Constructor with name, age, and department

        // Printing details of each student
        System.out.println("Student 1:");
        student1.printDetails();
        System.out.println("Student 2:");
        student2.printDetails();
        System.out.println("Student 3:");
        student3.printDetails();
    }
}
```

Output


<terminated> Main (3) [Java Application] C:\Users\Preetham\.p2\pool\plugins
Student 1:
Name: Unknown, Age: 20, Department: Unassigned
Student 2:
Name: Dex, Age: 23, Department: IT
Student 3:
Name: Brian, Age: 20, Department: Mathematics