

Lab-7

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.

```

class Vehicle
{
    » void start()
    » {
    » » System.out.println("Vehicle started");
    » » }
    » }
    //sub class
    class car extends Vehicle
    {
    » void start()
    » {
    » » System.out.println("car started");
    » » }
    » }
    //sub class
    class motorcycle extends Vehicle
    {
    » void start()
    » {
    » » System.out.println("motorcycle started");
    » » }
    » }
    class garage
    {
    » » public void serviceVehicle(Vehicle vehicle)
    » » {
    » » » vehicle.start();
    » » » System.out.println("Vehicle serviced");
    » » » }
    » }
}

```

```

public class Vehicle1
{
    » public static void main (String[] args)
    » {
    » » //Create instances of Car and Motorcycle
    » » » car c = new car();
    » » » motorcycle m = new motorcycle();
    » » » }
    » » //Create an instance of Garage
    » » » garage g = new garage();
    » » » }
    » » //Service the vehicles
    » » » g.serviceVehicle(c);
    » » » g.serviceVehicle(m);
    » }
}

```

Output

```
car started  
Vehicle serviced  
motorcycle started  
Vehicle serviced
```

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. Print out the details of each student, including their name, age, and department.

```
public class Student3
{
    // Fields (Instance variables)
    private String name;
    private int age;
    private String department;

    // Default constructor
    public Student3() {
        this.name = "Unknown";
        this.age = 20;
        this.department = "Unassigned";
    }

    // Constructor with two parameters: name and age
    public Student3(String name, int age) {
        this.name = name;
        this.age = age;
        this.department = "IT";
    }

    // Constructor with three parameters: name, age, and department
    public Student3(String name, int age, String department) {
        this.name = name;
        this.age = age;
        this.department = department;
    }

    // Method to display student details
    public void displayDetails() {
        System.out.println("Name: " + name);
        System.out.println("Age: " + age);
    }
}
```

```

» .....System.out.println("Department: " + department);
» .....System.out.println();
» .....}
»
» .....public static void main(String[] args) {
» .....    // Creating instances of Student using each constructor
» .....    Student3 student1 = new Student3();
» .....    Student3 student2 = new Student3("Alice", 22);
» .....    Student3 student3 = new Student3("Bob", 24, "Engineering");
» .....
» .....    // Printing the details of each student
» .....    student1.displayDetails();
» .....    student2.displayDetails();
» .....    student3.displayDetails();
» .....}
» }

```

Output

```

Name: Unknown
Age: 20
Department: Unassigned

Name: Alice
Age: 22
Department: IT

Name: Bob
Age: 24
Department: Engineering

```