**Lab - ANP-C9531 - Polymorphism**

**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.**

**Code:**

**package assignment2;**

**//Base class**

**class Vehicle {**

**void start() {**

**System.*out*.println("Vehicle started.");**

**}**

**}**

**//Subclass Car**

**class Car extends Vehicle {**

**@Override**

**void start() {**

**System.*out*.println("Car started.");**

**}**

**}**

**//Subclass Motorcycle**

**class Motorcycle extends Vehicle {**

**@Override**

**void start() {**

**System.*out*.println("Motorcycle started.");**

**}**

**}**

**//Garage class**

**class Garage {**

**void serviceVehicle(Vehicle vehicle) {**

**vehicle.start();**

**System.*out*.println("Vehicle serviced.");**

**}**

**}**

**//Main class**

**public class Vehicle {**

**public static void main(String[] args) {**

**Car car = new Car();**

**Motorcycle motorcycle = new Motorcycle();**

**Garage garage = new Garage();**

**// Call the serviceVehicle method for both Car and Motorcycle**

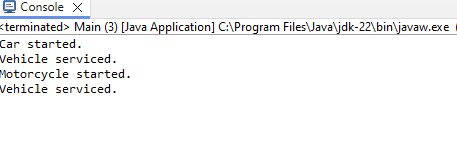
**garage.serviceVehicle(car);**

**garage.serviceVehicle(motorcycle);**

**}**

**}**

**Output**

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**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.**

**Code:**

**// Student class**

**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 two parameters: name and age**

**public Student(String name, int age) {**

**this.name = name;**

**this.age = age;**

**this.department = "IT";**

**}**

**// Constructor with three parameters: 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);**

**System.out.println("Age: " + age);**

**System.out.println("Department: " + department);**

**System.out.println();**

**}**

**}**

**// Main class**

**public class Main {**

**public static void main(String[] args) {**

**// Creating instances of the Student class using each constructor**

**Student student1 = new Student();**

**Student student2 = new Student("Alice", 22);**

**Student student3 = new Student("Bob", 25, "Engineering");**

**// Printing the details of each student**

**System.out.println("Student 1 Details:");**

**student1.printDetails();**

**System.out.println("Student 2 Details:");**

**student2.printDetails();**

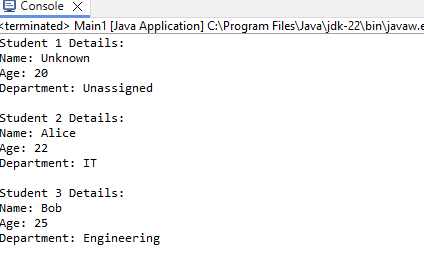
**System.out.println("Student 3 Details:");**

**student3.printDetails();**

**}**

**}**

**Output :**

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