Department of Computer Science

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OOP Assignment: 02

Problem # 1: [CLO2]

Create a Java class named Car to represent a vehicle, with attributes for make (String), model (String), year (int), and mileage (double). Develop both a default constructor that initializes all attributes to default values and a parameterized constructor to set all attributes. Ensure appropriate getter and setter methods are included for all attributes. Additionally, implement a method called drive(double distance) for updating the mileage. Write a Java program that demonstrates the functionality of the Car class by prompting the user to input values for the car's attributes in the main method and then passing these values to create instances of Car. Finally, display the updated mileage after each drive.

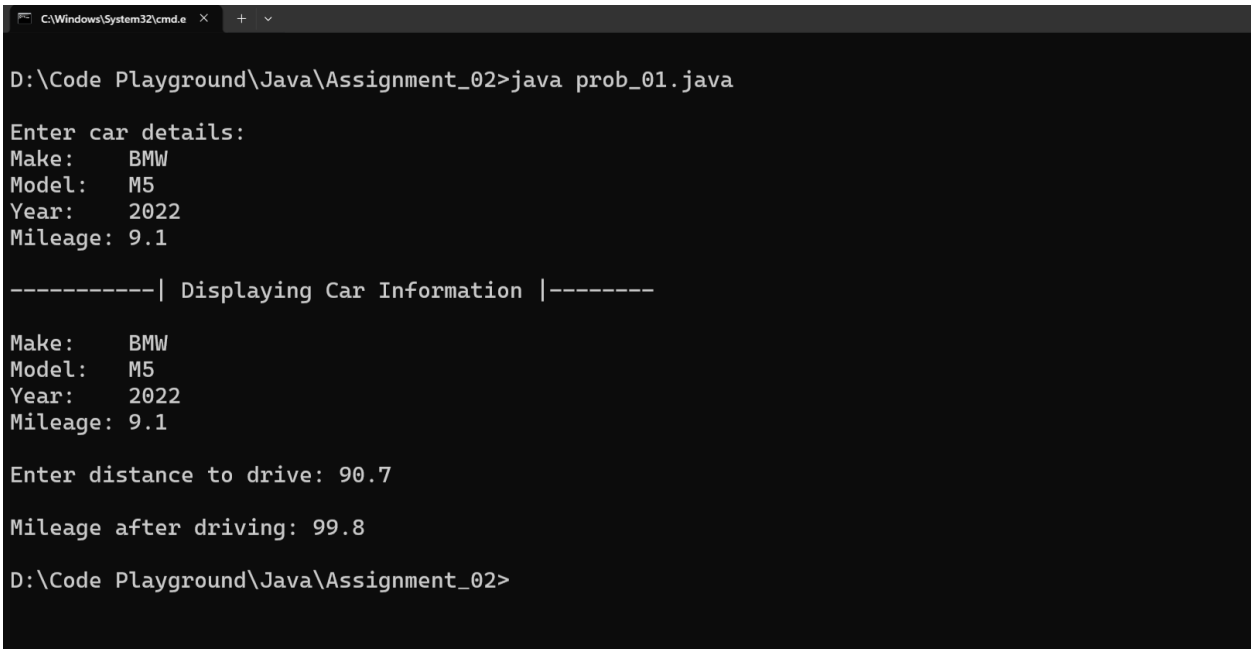
Source Code:

```
import java.util.Scanner;

public class prob_01 {

   public static void main(String args[]) {

      Scanner input = new Scanner(System.in);

      Car vehicle1 = new Car();

      System.out.println("\nEnter car details:");

      System.out.print("Make:    ");

      String make = input.nextLine();

      System.out.print("Model:   ");

      String model = input.nextLine();

      System.out.print("Year:    ");

      int year = input.nextInt();

      System.out.print("Mileage: ");

      double mileage = input.nextDouble();

      vehicle1.setMake(make);

      vehicle1.setModel(model);

      vehicle1.setYear(year);

      vehicle1.setMileage(mileage);

      System.out.println("\n----------| Displaying Car Information |--------\n");

      System.out.println("Make:    " + vehicle1.getMake());

      System.out.println("Model:   " + vehicle1.getModel());
```

```
        System.out.println("Year:    " + vehicle1.getYear());
        System.out.println("Mileage: " + vehicle1.getMileage());
        System.out.print("\nEnter distance to drive: ");
        double distance = input.nextDouble();
        vehicle1.drive(distance);
        System.out.println("\nMileage after driving: " + vehicle1.getMileage());
    }
}

class Car {
    private String make;
    private String model;
    private int year;
    private double mileage;
    Car() {
        this.make = "";
        this.model = "";
        this.year = 0;
        this.mileage = 0.0;
    }
    Car(String make, String model, int year, double mileage) {
        this.make = make;
        this.model = model;
        this.year = year;
        this.mileage = mileage;
    }
    void setMake(String make) {
        this.make = make;
    }
```

```
    String getMake() {
        return make;
    }
    void setModel(String model) {
        this.model = model;
    }
    String getModel() {
        return model;
    }
    void setYear(int year) {
        this.year = year;
    }
    int getYear() {
        return year;
    }
    void setMileage(double mileage) {
        this.mileage = mileage;
    }
    double getMileage() {
        return mileage;
    }

    public void drive(double distance) {
        mileage += distance;
    }
}
```

OUTPUT:



Problem # 2: [CLO2]

Design a Java class named Employee to represent an employee, including attributes for name (String), id (int), department (String), and salary (double). Implement a default constructor to initialize all attributes to default values and a parameterized constructor to set all attributes. Include appropriate getter and setter methods for all attributes. Additionally, implement a method called calculateTax(double amount) to calculate the tax on the employee's salary based on the following criteria: If the salary is greater than 50,000, the tax rate is 5%. If the salary is between 30,000 and 50,000, the tax rate is 3%. If the salary is less than 30,000, the tax rate is 2%. Write a Java program to demonstrate the functionality of the Employee class by prompting the user to input values for the employee's attributes in the main method. Create instances of Employee using these input values and display the calculated tax for each employee.

Source Code:

```
import java.util.Scanner;

public class prob_02 {

   public static void main(String args[]) {

      Scanner input = new Scanner(System.in);

      Employee employee1 = new Employee();
```

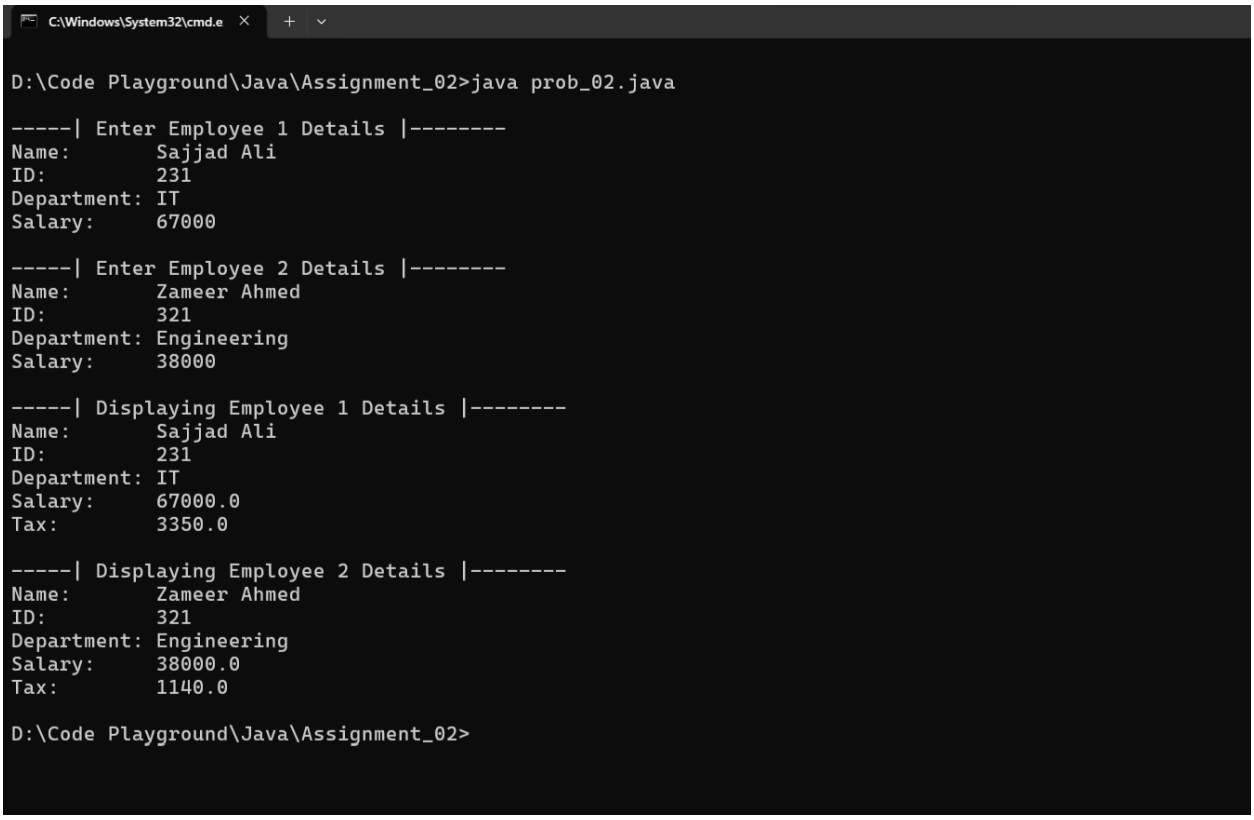
```
System.out.print("\n-----| Enter Employee 1 Details |--------\n");
System.out.print("Name:      ");
String name = input.nextLine();
System.out.print("ID:        ");
int id = input.nextInt();
input.nextLine(); // Consume newline character
System.out.print("Department: ");
String department = input.nextLine();
System.out.print("Salary:    ");
double salary = input.nextDouble();
input.nextLine(); // Consume newline character
employee1.setName(name);
employee1.setId(id);
employee1.setDepartment(department);
employee1.setSalary(salary);

Employee employee2 = new Employee();
System.out.print("\n-----| Enter Employee 2 Details |--------\n");
System.out.print("Name:      ");
name = input.nextLine();
System.out.print("ID:        ");
id = input.nextInt();
input.nextLine(); // Consume newline character
System.out.print("Department: ");
department = input.nextLine();
System.out.print("Salary:    ");
salary = input.nextDouble();
input.nextLine(); // Consume newline character
employee2.setName(name);
```

```
        employee2.setId(id);
        employee2.setDepartment(department);
        employee2.setSalary(salary);

        // displaying all Employee information
        System.out.println("\n-----| Displaying Employee 1 Details |--------");
        System.out.println("Name:       " + employee1.getName());
        System.out.println("ID:         " + employee1.getId());
        System.out.println("Department: " + employee1.getDepartment());
        System.out.println("Salary:     " + employee1.getSalary());
        System.out.println("Tax:        " + employee1.calculateTax(employee1.getSalary()));

        System.out.println("\n-----| Displaying Employee 2 Details |--------");
        System.out.println("Name:       " + employee2.getName());
        System.out.println("ID:         " + employee2.getId());
        System.out.println("Department: " + employee2.getDepartment());
        System.out.println("Salary:     " + employee2.getSalary());
        System.out.println("Tax:        " + employee2.calculateTax(employee2.getSalary()));

    }
}

class Employee {
    private String name;
    private int id;
    private String department;
    private double salary;
```

```
Employee() {
        this.name = "";
        this.id = 0;
        this.department = "";
        this.salary = 0.0;
    }

    Employee(String name, int id, String department, double salary) {
        this.name = name;
        this.id = id;
        this.department = department;
        this.salary = salary;
    }

    void setName(String name) {
        this.name = name;
    }
    String getName() {
        return name;
    }

    void setId(int id) {
        this.id = id;
    }
    int getId() {
        return id;
    }
    void setDepartment(String department) {
        this.department = department;
```

```
    }
    String getDepartment() {
        return department;
    }
    void setSalary(double salary) {
        this.salary = salary;
    }
    double getSalary() {
        return salary;
    }

    double calculateTax(double amount) {
        if(salary > 50000) {
            return salary*0.05; // 5% tax
        }
        else if(salary > 30000 && salary < 50000) {
            return salary*0.03; // 3% tax
        }
        else {
            return salary*0.02; // 2% tax
        }
    }
}
```

OUTPUT:



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