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**CSE(DS)**

## Smart Traffic Signal Optimization

**Scenario:** You are part of a team working on an initiative to optimize traffic signal management in a busy city to reduce congestion and improve traffic flow efficiency using smart technologies.

## Solution-

## Program:

```
class TrafficData {
    int vehicleCount;
    double speed;
    public TrafficData(int vehicleCount, double speed) {
        this.vehicleCount = vehicleCount;
        this.speed = speed;
    }
    public int getVehicleCount() {
        return vehicleCount;
    }
    public void setVehicleCount(int vehicleCount) {
        this.vehicleCount = vehicleCount;
    }
    public double getSpeed() {
        return speed;
    }
    public void setSpeed(double speed) {
        this.speed = speed;
```

```
    }
}
class TrafficSignalOptimization {
    public void optimizeSignalTiming(TrafficData data) {
        if (data.getVehicleCount() > 10) {
            System.out.println("Increasing the green light time.");
        }
        else {
            System.out.println("Maintaining the live signal timings.");
        }
    }
}
public class TrafficSignalControlApp {
    public static void main(String[] args) {
        TrafficData currentData = new TrafficData(5, 10.0);
        TrafficSignalOptimization optimizer=new TrafficSignalOptimization();
        optimizer.optimizeSignalTiming(currentData);
        System.out.println("Signal timings adjusted by live traffic data.");
    }
}
class TrafficVisualization {
    public void displayRealTimeData(TrafficData data) {
        System.out.println("Real-time Traffic Data:");
        System.out.println("Vehicle Count: " + data.getVehicleCount());
        System.out.println("Speed: " + data.getSpeed() + " km/h");
    }
    public void generateReports() {
```

```
        System.out.println("Generating the traffic flow reports");
    }
}
class TrafficManagementUI {
    public void displayTrafficManagerUI() {
        System.out.println("Traffic Manager UI displayed.");
    }
    public void displayCityOfficialDashboard() {
        System.out.println("City Official Dashboard displayed.");
    }
}
class TrafficSignalSystem {
    public void drawDataFlowDiagram() {
        System.out.println("Data Flow Diagram.");
    }
    public void implementAlgorithm() {
        System.out.println("Algorithm implemented.");
    }
    public void provideDocumentation() {
        System.out.println("Documentation provided.");
    }
    public void developUserInterface() {
        System.out.println("User interface developed.");
    }
    public void runTestCases() {
        System.out.println("Test case.");
    }
```

}

## Output:


java -cp /tmp/XXA38kAaNr/TrafficSignalControlApp
Maintaining the live signal timings.
Signal timings adjusted by live traffic data.
=== Code Execution Successful ===