

# Rajalakshmi Engineering College

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Batch: 2028

Degree: B.E - AI & ML

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## 2024\_28\_III\_OOPS Using Java Lab

### 2028\_REC\_OOPS using Java\_Week 7\_Q1

Attempt : 1

Total Mark : 10

Marks Obtained : 10

#### **Section 1 : Coding**

##### **1. Problem Statement:**

Rajiv is analyzing the energy consumption in his household and wants to calculate the total cost based on the daily energy usage. He is given the rate per unit of electricity and the energy consumed for multiple days. To structure this calculation efficiently, he decides to use an interface-based approach.

Implement an interface CostCalculator with the necessary methods to retrieve energy details and compute the cost. The calculations should be handled in the EnergyConsumptionTracker class, while the EnergyConsumptionApp class should only handle input and output.

##### **Formula**

Energy Cost for one day = Energy Consumed per day \* Rate Per Unit

### ***Input Format***

The first line of input consists of the rate per unit as an 'R' (a double value).

The second line of input consists of the number of days 'N' (an integer).

The third line of input consists of the daily energy consumption values for each day 'D' (double values), separated by space.

### ***Output Format***

The first line of the output prints: "Day-wise Energy Cost:"

The next N lines of the output print the day-wise energy costs(double type) and the total energy cost (double type) in Indian Rupees in the following format: "Day [day\_number]: Rs. [energy\_cost]"

The last line of the output prints: "Total Energy Cost: Rs. [total\_cost]"

Note: energy\_cost and total\_cost are rounded off to two decimal points

Refer to the sample output for the formatting specifications.

### ***Sample Test Case***

Input: 0.01

3

10.0 20.0 30.0

Output: Day-wise Energy Cost:

Day 1: Rs. 0.10

Day 2: Rs. 0.20

Day 3: Rs. 0.30

Total Energy Cost: Rs. 0.60

### ***Answer***

```
import java.util.Scanner;
```

```
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```

```
import java.util.Locale;

interface CostCalculator {
    void getEnergyDetails(Scanner sc); // Read daily consumption
    void calculateAndDisplayCost(); // Calculate and print costs
}

class EnergyConsumptionTracker implements CostCalculator {
    private double ratePerUnit;
    private int numDays;
    private double[] dailyConsumption;

    // Constructor with rate and number of days
    public EnergyConsumptionTracker(double ratePerUnit, int numDays) {
        this.ratePerUnit = ratePerUnit;
        this.numDays = numDays;
        this.dailyConsumption = new double[numDays];
    }

    // Read daily consumption values
    @Override
    public void getEnergyDetails(Scanner sc) {
        for (int i = 0; i < numDays; i++) {
            dailyConsumption[i] = sc.nextDouble();
        }
    }

    // Calculate and print day-wise and total costs
    @Override
    public void calculateAndDisplayCost() {
        System.out.println("Day-wise Energy Cost:");
        double totalCost = 0.0;
        for (int i = 0; i < numDays; i++) {
            double cost = dailyConsumption[i] * ratePerUnit;
            totalCost += cost;
            System.out.printf("Day %d: Rs. %.2f%n", i + 1, cost);
        }
        System.out.printf("Total Energy Cost: Rs. %.2f%n", totalCost);
    }
}

public class Main {
```

```
public static void main(String[] args) {
    Scanner sc = new Scanner(System.in);
    sc.useLocale(Locale.US);

    double ratePerUnit = sc.nextDouble();
    int numDays = sc.nextInt();

    CostCalculator tracker = new EnergyConsumptionTracker(ratePerUnit,
    numDays);
    tracker.getEnergyDetails(sc);
    tracker.calculateAndDisplayCost();

    sc.close();
}

class EnergyConsumptionApp {
    public static void main(String[] args) {
        Scanner scanner = new Scanner(System.in);

        double ratePerUnit = scanner.nextDouble();
        int numDays = scanner.nextInt();

        CostCalculator tracker = new EnergyConsumptionTracker(ratePerUnit,
        numDays);

        tracker.getEnergyDetails(scanner);
        tracker.calculateAndDisplayCost();

        scanner.close();
    }
}
```

**Status :** Correct

**Marks :** 10/10