Rajalakshmi Engineering College

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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;

interface CostCalculator{

```java
    void getEnergyDetails(Scanner scanner);
    void calculateAndDisplayCost();
}
class EnergyConsumptionTracker implements CostCalculator{
    private double rate;
    private int numdays;
    private double[] dailyconsumption;
    public EnergyConsumptionTracker(double rate, int numdays){
        this.rate = rate;
        this.numdays = numdays;
        this.dailyconsumption = new double[numdays];
    }
    public void getEnergyDetails(Scanner scanner){
        for (int i=0;i<numdays;i++){
            dailyconsumption[i] = scanner.nextDouble();
        }
    }
    public void calculateAndDisplayCost(){
        double totalcost = 0;
        System.out.println("Day-wise Energy Cost:");
        for(int i=0;i<numdays;i++){
            double costperday = rate*dailyconsumption[i];
            totalcost += costperday;
            System.out.printf("Day %d: Rs. %.2f\n",i+1,costperday);
        }
        System.out.printf("Total Energy Cost: Rs. %.2f",totalcost);
    }
}
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**