Week=2

Lab Set=5

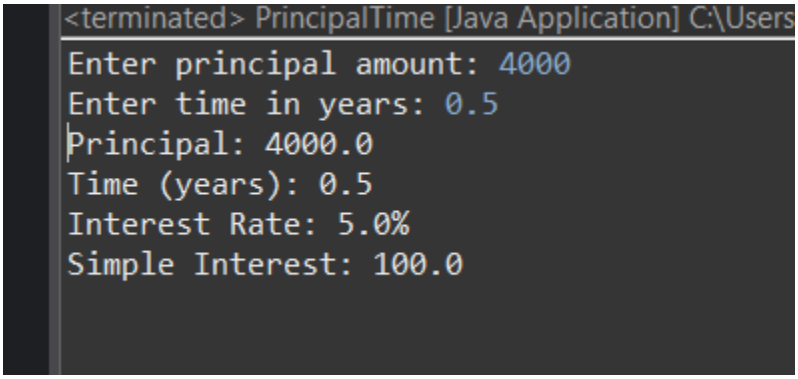
1. Write a program to enter P,T (principal and time) and calculate simple interest. Use the Scanner class for taking inputs from the console. Users will enter the principal amount and time(in years).Create an if-else statement and modify the interest rate based on the principal amount. If the amount > 10000 then the interest rate is 10%. If the amount is between 10000 and 5000 then make the interest rate 8%. For any amount below 5000 the interest rate should be 5%.

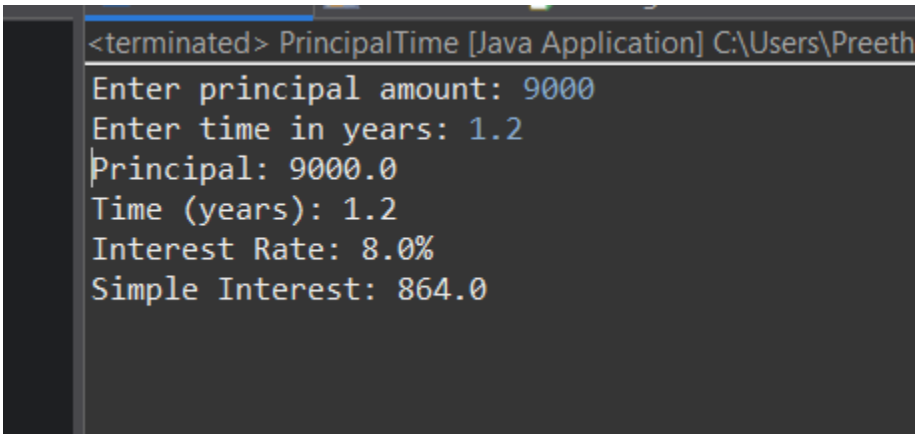
Source code

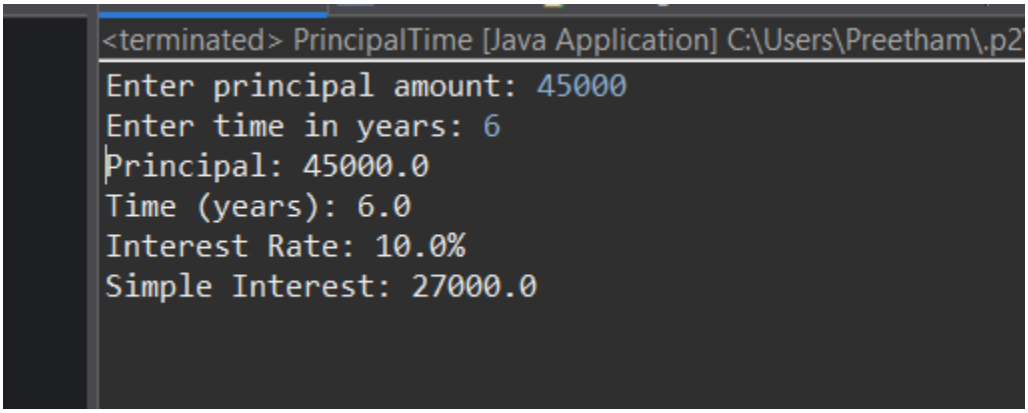
PrincipalTime.java

```java
package anudip.java.lab;

import java.util.Scanner;

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

        // Input principal and time
        System.out.print("Enter principal amount: ");
        double principal = sc.nextDouble();

        System.out.print("Enter time in years: ");
        double time = sc.nextDouble();

        // Set interest rate according to principal amount
        double rate;
        if (principal > 10000) {
            rate = 10.0;
        } else if (principal >= 5000) {
            rate = 8.0;
        } else {
            rate = 5.0;
        }

        // Calculate simple interest
        double simpleInterest = (principal * time * rate) / 100;

        // Output the results
        System.out.println("Principal: " + principal);
        System.out.println("Time (years): " + time);
        System.out.println("Interest Rate: " + rate + "%");
        System.out.println("Simple Interest: " + simpleInterest);

        sc.close();
    }
}
```

Output


<terminated> PrincipalTime [Java Application] C:\Users
Enter principal amount: 4000
Enter time in years: 0.5
Principal: 4000.0
Time (years): 0.5
Interest Rate: 5.0%
Simple Interest: 100.0


<terminated> PrincipalTime [Java Application] C:\Users\Preeth
Enter principal amount: 9000
Enter time in years: 1.2
Principal: 9000.0
Time (years): 1.2
Interest Rate: 8.0%
Simple Interest: 864.0


<terminated> PrincipalTime [Java Application] C:\Users\Preetham\.p2
Enter principal amount: 45000
Enter time in years: 6
Principal: 45000.0
Time (years): 6.0
Interest Rate: 10.0%
Simple Interest: 27000.0

2. Write a program to enter marks of five subjects and calculate total marks and average. Each subject has a full mark of 100. Give grades based on average marks. Grades should be Ex (>90%), A (>80%) , B(>60%) ,C (>=40%) and F(<40%). Use the Scanner class to take inputs from the console.

Source code

```java
import java.util.Scanner;

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

        // Input student's name
        System.out.print("Enter student name: ");
        String name = sc.nextLine();

        // Input marks for five subjects
        int[] marks = new int[5];
        int total = 0;
        for (int i = 0; i < 5; i++) {
            System.out.print("Enter marks for subject " + (i + 1) + ": ");
            marks[i] = sc.nextInt();
            total += marks[i];
        }

        // Calculate average
        double average = total / 5.0;

        // Calculate grade
        String grade;
        double percentage = (total / 500.0) * 100; // each subject out of 100, so max total is 500

        if (percentage > 90) {
            grade = "Ex";
        } else if (percentage > 80) {
            grade = "A";
        } else if (percentage > 60) {
            grade = "B";
        } else if (percentage >= 40) {
            grade = "C";
        } else {
            grade = "F";
        }

        // Output
        System.out.println("\nStudent Name: " + name);
        System.out.println("Total Marks: " + total + "/500");
        System.out.println("Average Marks: " + average);
        System.out.println("Percentage: " + percentage + "%");
        System.out.println("Grade: " + grade);

        sc.close();
    }
}
```

Output

```
Enter student name: preetham
Enter marks for subject 1: 85
Enter marks for subject 2: 78
Enter marks for subject 3: 65
Enter marks for subject 4: 75
Enter marks for subject 5: 94

Student Name: preetham
Total Marks: 397/500
Average Marks: 79.4
Percentage: 79.4%
Grade: B
```

```
<terminated> StudentMarks [Java Application] C:\Users\P
Enter student name: maria
Enter marks for subject 1: 87
Enter marks for subject 2: 98
Enter marks for subject 3: 88
Enter marks for subject 4: 95
Enter marks for subject 5: 89

Student Name: maria
Total Marks: 457/500
Average Marks: 91.4
Percentage: 91.4%
Grade: Ex
```

```
<terminated> StudentMarks [Java Application] C:\Users\Preetham\
Enter student name: guru
Enter marks for subject 1: 87
Enter marks for subject 2: 81
Enter marks for subject 3: 79
Enter marks for subject 4: 72
Enter marks for subject 5: 88

Student Name: guru
Total Marks: 407/500
Average Marks: 81.4
Percentage: 81.39999999999999%
Grade: A
```

```
Enter student name: rashmi
Enter marks for subject 1: 15
Enter marks for subject 2: 65
Enter marks for subject 3: 14
Enter marks for subject 4: 52
Enter marks for subject 5: 12

Student Name: rashmi
Total Marks: 158/500
Average Marks: 31.6
Percentage: 31.6%
Grade: F
```

```
<terminated> StudentMarks [Java Application] C:\Users\Preetham\.p2\pool\plug
Enter student name: sanjana
Enter marks for subject 1: 45
Enter marks for subject 2: 54
Enter marks for subject 3: 84
Enter marks for subject 4: 54
Enter marks for subject 5: 40

Student Name: sanjana
Total Marks: 277/500
Average Marks: 55.4
Percentage: 55.400000000000006%
Grade: C
```

3. Write a program which calculates the monthly bill amount for a internet subscriber based on the following logic:
    1) If the total data consumed is less than 10 GB then bill amount will be Rs. 300. (Basic charge)
    2) If the data consumed is between 10 GB and 30 GB then bill amount will be basic charge + 5* (Total GB consumed - 10). That means consumers will be charged Rs 5 for each additional GB consumed over 10 GB.
    3) If the consumer consumes more than 30 GB then

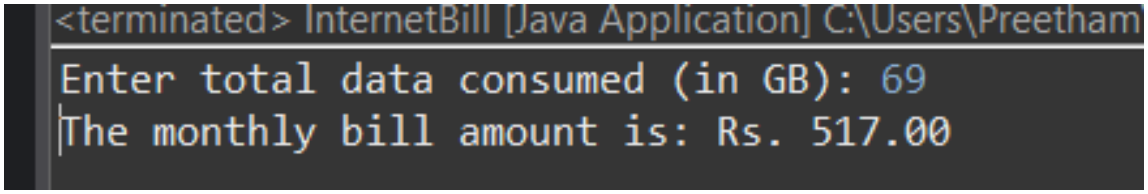
       The bill amount = 400 + 3 *(Total GB consumed - 30). That means the consumer has to pay additional Rs 3 for each GB above 30GB.

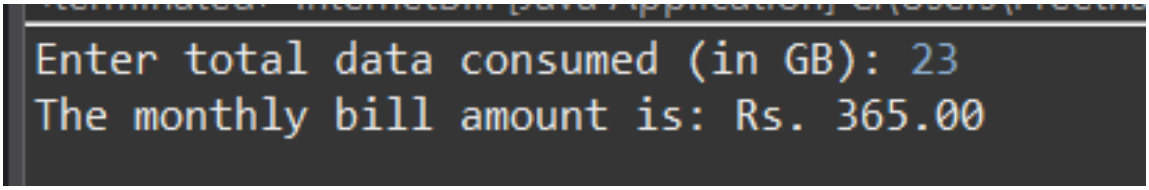
       Use if-else block to solve the problem.

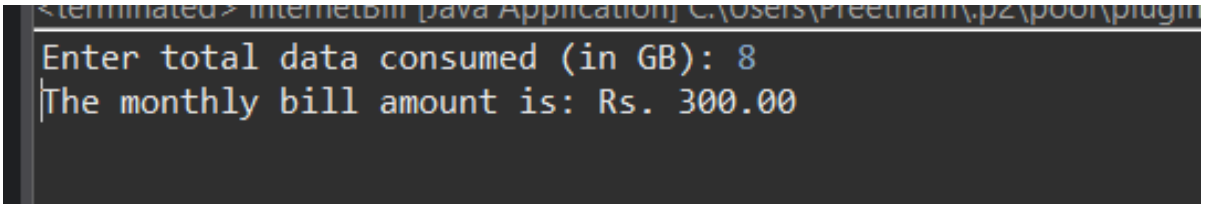
Source code

```java
package anudip.java.lab;

import java.util.Scanner;

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

        // Prompt user for total data consumed in GB
        System.out.print("Enter total data consumed (in GB): ");
        double totalDataConsumed = scanner.nextDouble();

        double billAmount;

        // Calculate bill amount based on data consumed
        if (totalDataConsumed < 10) {
            billAmount = 300; // Basic charge
        } else if (totalDataConsumed >= 10 && totalDataConsumed <= 30) {
            billAmount = 300 + 5 * (totalDataConsumed - 10); // Additional charge for data between 10 and 30 GB
        } else {
            billAmount = 400 + 3 * (totalDataConsumed - 30); // Additional charge for data above 30 GB
        }

        // Display the bill amount
        System.out.printf("The monthly bill amount is: Rs. %.2f%n", billAmount);

        // Close the scanner
        scanner.close();
    }
}
```

Output


<terminated> InternetBill [Java Application] C:\Users\Preetham
Enter total data consumed (in GB): 69
The monthly bill amount is: Rs. 517.00


Enter total data consumed (in GB): 23
The monthly bill amount is: Rs. 365.00


Enter total data consumed (in GB): 8
The monthly bill amount is: Rs. 300.00