Swapnanil Dutta Roll:12

Question: Write a program to show Fibonacci series up to nth terms using recursion.

Code:

```
import java.util.Scanner;

class Fibo{
    static int n1=0,n2=1,n3=0;
    static void printFibonacci(int n){
       if(n>0){

            n3 = n1 + n2;
            n1 = n2;
            n2 = n3;
            System.out.print(" "+n3);
            printFibonacci(n-1);
        }
    }
    public static void main(String args[]){
        Scanner input = new Scanner(System.in);
        System.out.println("Enter the value of n: ");
        int n= Integer.parseInt(input.nextLine());
        System.out.print(n1+" "+n2);
        printFibonacci(n-2);
    }
}
```

Output:

```
PS D:\OOPS-PCC-CS593\Day 3 (18.09.2020)> javac Fibo.java
PS D:\OOPS-PCC-CS593\Day 3 (18.09.2020)> java Fibo
Enter the value of n:
10
0 1 1 2 3 5 8 13 21 34
```

Question: Write a program to calculate the simple interest (si) while your inputs are principle(p), time in years (n) and rate of interest (r)[take input using command-line argument]

Code:

```java
import java.util.Scanner;

public class SimpleInterest{
    public static void main(String[]args){
        Scanner reader = new Scanner(System.in);
        System.out.println("Enter the principal ammount: ");
        Double principal = Double.parseDouble(reader.nextLine());
        System.out.println("Enter the time period: ");
        Double time = Double.parseDouble(reader.nextLine());
        System.out.println("Enter the rate of interest: ");
        Double rate = Double.parseDouble(reader.nextLine());
        Double simpleinterest = (principal*time*rate)/100;
        System.out.println("Your simple interest is: " + simpleinterest);
    }
}
```

Output:

```
PS D:\OOPS-PCC-CS593\Day 3 (18.09.2020)> javac SimpleInterest.java
PS D:\OOPS-PCC-CS593\Day 3 (18.09.2020)> java SimpleInterest
Enter the principal ammount:
5000
Enter the time period:
2
Enter the rate of interest:
5
Your simple interest is: 500.0
```

Question: Write a program to find the real roots of the quadratic equation $ax^2+ bx + c= 0$ where a, b and c are constants

Code:

```
import java.io.*;
import java.util.Scanner;
import java.lang.Math.*;

class Quadratic {
    void findRoots(int a, int b, int c) {
     if (a == 0) {
        System.out.println("It's a Linear Equation!");
        return;
    }
     int d  = b*b - 4*a*c;
     double sqrt_val = Math.sqrt(Math.abs(d));

     if (d > 0) {
        System.out.println("Roots are real and different \n");

        System.out.println((double)(-b + sqrt_val) / (2 * a) + "\n"
                           + (double)(-b - sqrt_val) / (2 * a));
     }
     else // d < 0
     {
        System.out.println("Roots are complex \n");
            return;
        }
    }
public static void main(String args[]) {
       Quadratic obj = new Quadratic();
       int a,b,c;
       Scanner sc= new Scanner(System.in);
       System.out.println("enter value of a , b ,c ");
        a=sc.nextInt();
        b=sc.nextInt();
```

```
        c=sc.nextInt();
       obj.findRoots(a, b, c);
    }
}
```

Output:

```
PS D:\OOPS-PCC-CS593\Day 3 (18.09.2020)> javac Quadratic.java
PS D:\OOPS-PCC-CS593\Day 3 (18.09.2020)> java Quadratic
enter value of a , b ,c
1
2
-8
Roots are real and different

2.0
-4.0
```

Question: WAP to print all prime number within a given range

Code:

```
import java.util.Scanner;

public class Prime {
    public static boolean isPrime(int n) {
        for (int i = 2; i <= n / 2; i++)
            if (n % i == 0)
                return false;
        return true;
    }
    public static void main(String[]args){
        Scanner input = new Scanner(System.in);
        System.out.println("Enter start and end: ");
        int start = Integer.parseInt(input.nextLine());
        int end = Integer.parseInt(input.nextLine());
        if (start > end)
            System.out.println("Lower limit can not be greater than higher
limit!!");
        System.out.println("The prime number(s) in between " + start + "
and " + end + " is/are as follows");
        for (int i = start; i <= end; i++)
            if (isPrime(i))
                System.out.print(i + " ");
        System.out.println();
    }
}
```

Output:

```
PS D:\OOPS-PCC-CS593\Day 3 (18.09.2020)> javac Prime.java
PS D:\OOPS-PCC-CS593\Day 3 (18.09.2020)> java Prime
Enter start and end:
100
200
The prime number(s) in between 100 and 200 is/are as follows
101 103 107 109 113 127 131 137 139 149 151 157 163 167 173 179 181 191 193 197 199
```

Question: WAP to calculate GCD of two numbers.

Code:

```
import java.util.Scanner;

public class GCD {
    public static int getgcd(int a, int b){
        if(b != 0)
            return getgcd(b, a % b);
        return a;
    }

    public static void main(String[]args){
        Scanner input = new Scanner(System.in);
        System.out.print("Enter the value of a: ");
        int a = Integer.parseInt(input.nextLine());
        System.out.print("Enter the value of b: ");
        int b = Integer.parseInt(input.nextLine());
        if(a < b){
            a = a + b;
            b = a - b;
            a = a - b;
        }
        System.out.printf("The GCD of %d and %d: %d", a , b , getgcd(a ,
b));
    }
}
```

Output:

```
PS D:\OOPS-PCC-CS593\Day 3 (18.09.2020)> javac GCD.java
PS D:\OOPS-PCC-CS593\Day 3 (18.09.2020)> java GCD
Enter the value of a: 18
Enter the value of b: 81
The GCD of 81 and 18: 9
```

Question: Write a Program of Sum of Series ($1+x+x^2+x^3+x^4+$..... upto n-th terms).

Code:

```
import java.util.Scanner;
import java.lang.Math;

public class SumSeries{
    public static void main(String[]args){
        Scanner scan = new Scanner(System.in);
        System.out.println("Enter the value of a: ");
        int a = Integer.parseInt(scan.nextLine());
        System.out.println("Enter the value of b: ");
        int b = Integer.parseInt(scan.nextLine());
        double sum = 0.0;
        for(int i = 0; i < b; i++){
            sum += Math.pow(a,i);
        }
        System.out.println("Sum of the series is: " +
String.format("%.2f", sum));
    }
}
```

Output:

```
PS D:\OOPS-PCC-CS593\Day 3 (18.09.2020)> javac SumSeries.java
PS D:\OOPS-PCC-CS593\Day 3 (18.09.2020)> java SumSeries
Enter the value of a:
5
Enter the value of b:
2
Sum of the series is: 6.00
```