

PROGRAMMING IN JAVA LAB-1

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Batch-AIML A1

Program Description- Part1: Implement a menu-driven Java program (like fib or factorial) to implement these input methods in java (command line args, Scanner, Buffered Reader, DataInputStream, Console)

Part 2: Implement a simple menu driven calculator in java to implement add, sub, mul, div, sqrt, power, mean, variance. Implement a separate Calculator class to include all related function inside that class. (mean calculation: program reads numbers from the keyboard, summing them in the process until the user enters the string "end". It then stops input & displays the avg. of numbers)

//

Part-1

import java.io.*;

import java.util.Scanner;

class Get_Factorial

{

void fetch_fact(int n)

{

int fact = 1;

for(int i=1; i<=n; i++)

{

fact = fact*i;

}

System.out.println("Factorial of "+n+" is: "+fact);

}

}

public class Factorial

{

public static void main(String[] args) throws IOException

```

{
    Get_Factorial obj1 = new Get_Factorial();
    BufferedReader b = new BufferedReader(new InputStreamReader(System.in));

    //creating a menu
    int choice;

    System.out.println("Enter your choice: ");
    System.out.println("1. Command Line Arg");
    System.out.println("2. Scanner");
    System.out.println("3. BufferedReader");
    System.out.println("4. DataInputStream");
    System.out.println("5. Console");
    System.out.println("6. Exit");
    choice = Integer.parseInt(b.readLine());

    if(choice == 1)
    {
        obj1.fetch_fact(Integer.parseInt(args[0]));
    }
    else if(choice == 2)
    {
        Scanner myObj = new Scanner(System.in);
        System.out.print("Enter your number for scanner: ");
        int a = myObj.nextInt();
        obj1.fetch_fact(a);
        myObj.close();
    }
    else if(choice == 3)
    {
        BufferedReader a1 = new BufferedReader(new InputStreamReader(System.in));
        System.out.print("Enter your number for BufferReader: ");
    }
}

```

```

        String n = a1.readLine();
        int n1 = Integer.parseInt(n);
        obj1.fetch_fact(n1);
    }
    else if(choice == 4)
    {
        DataInputStream a2 = new DataInputStream(new
FileInputStream("C:\\Users\\nayye\\OneDrive\\Desktop\\JAVA\\input.txt"));
        String s = a2.readLine();
        int n2 = Integer.parseInt(s);
        obj1.fetch_fact(n2);
        a2.close();
    }
    else if(choice == 5)
    {
        Console a3 = System.console();
        System.out.print("Enter your number for console: ");
        int n3 = Integer.parseInt(a3.readLine());
        obj1.fetch_fact(n3);
    }
    else if(choice == 6)
    {
        System.exit(0);
    }
    else
    {
        System.out.println("Invalid choice");
    }
}
}

```

OUTPUT:

```
Enter your choice:
1. Command Line Arg
2. Scanner
3. BufferedReader
4. DataInputStream
5. Console
6. Exit
2
Enter your number for scanner: 4
Factorial of 4 is: 24
```

PART-2

```
import java.io.*;
import java.util.*;

public class Calculator {

    public static void main(String[] args) {

        Scanner reader = new Scanner(System.in);

        int m,k=0,gcd=1;

        System.out.print("Menu:\n1)add\n2)sub\n3)mul\n4)div\n5)sqrt\n6)power\n7)mean\n8)variance\n9)GCD\n");

        System.out.print("Enter choice: ");

        int i = reader.nextInt();

        double first,second;

        double result;

        switch(i)
        {
            case 1:

                System.out.print("Enter first number: ");

                first = reader.nextDouble();

                System.out.print("Enter second number: ");

                second = reader.nextDouble();
```

```
result = first + second;  
  
System.out.printf("%.1f + %.1f = %.1f",  
    first,second, result);  
  
break;
```

case 2:

```
System.out.print("Enter first number: ");  
  
first = reader.nextDouble();  
  
System.out.print("Enter second number: ");  
  
second = reader.nextDouble();  
  
result = first - second;  
  
System.out.printf("%.1f - %.1f = %.1f",  
    first,second, result);  
  
break;
```

case 3:

```
System.out.print("Enter first number: ");  
  
first = reader.nextDouble();  
  
System.out.print("Enter second number: ");  
  
second = reader.nextDouble();  
  
result = first * second;  
  
System.out.printf("%.1f * %.1f = %.1f",  
    first,second, result);  
  
break;
```

case 4:

```
System.out.print("Enter first number: ");  
  
first = reader.nextDouble();  
  
System.out.print("Enter second number: ");  
  
second = reader.nextDouble();  
  
result = first / second;  
  
System.out.printf("%.1f / %.1f = %.1f",  
    first,second, result);  
  
break;
```

case 5:

```
System.out.print("Enter second number: ");  
second = reader.nextDouble();  
result = Math.sqrt(second);  
System.out.printf("Square root of %.1f = %.1f",  
    second, result);  
break;
```

case 6:

```
System.out.print("Enter first number: ");  
first = reader.nextDouble();  
System.out.print("Enter power: ");  
int p = reader.nextInt();  
result = Math.pow(first,p);  
System.out.printf("Power %d of %.1f = %.1f",p,first,  
    result);  
break;
```

case 7:

```
Scanner sc = new Scanner(System.in);  
String s = "";  
int count=0;  
int total=0;  
double avg=0;  
int n;  
System.out.print("Please enter end to stop taking input: ");  
while (true)  
{  
    String input = sc.nextLine();  
    if(input.equals("end"))  
        break;
```

```

        else
        {
            n = Integer.parseInt(input);

            count+=1;

            total += n;

            avg=total/n;

        }

    }

    System.out.println("Mean is "+avg);

```

case 8:

```

    System.out.print("Enter how many numbers you want to enter: ");

    int o = reader.nextInt();

    int ar[]=new int[o];

    for(int l=0;l<o;l++)

    {

        ar[l] = reader.nextInt();

        k=k+ar[l];

    }

    int mean=k/o;

    double sqDiff = 0;

    for (int q = 0; q < o; q++)

        sqDiff += (ar[q] - mean) * (ar[q] - mean);

    result=sqDiff/o;

    System.out.printf("Variance = %.3f", result);

    break;

```

case 9:

```

    System.out.print("Enter first number: ");

```

```

        int n1 = reader.nextInt();

        System.out.print("Enter second number: ");

        int n2 = reader.nextInt();

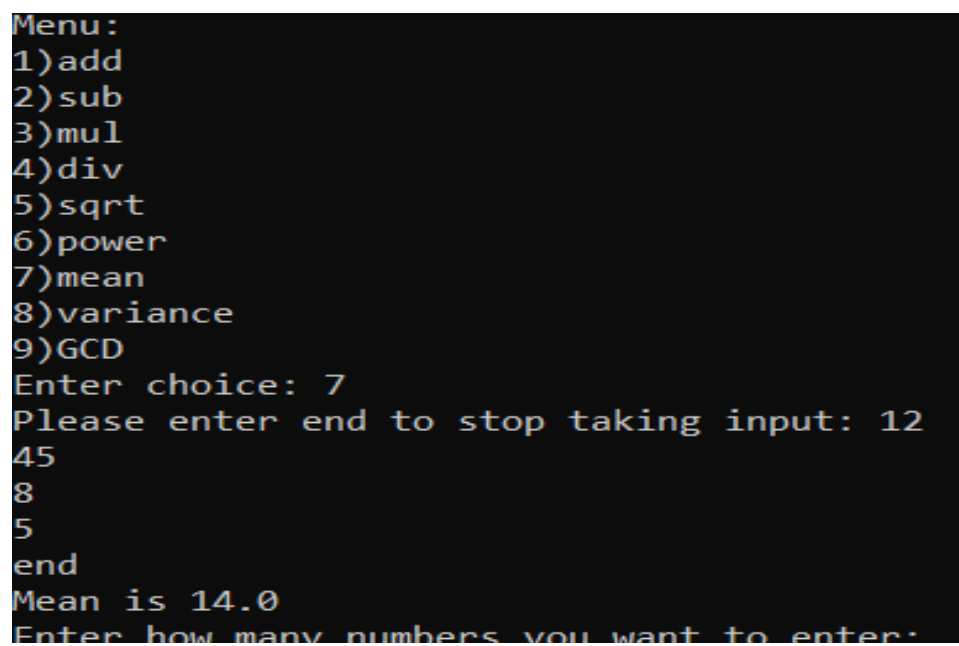
        for(int h = 1; h <= n1 && h <= n2; ++h)
        {
            if(n1 % h==0 && n2 % h==0)
                gcd = h;
        }

        System.out.printf("G.C.D of %d and %d is %d", n1,
            n2, gcd);

        break;
    default:
        System.out.printf("Wrong choice");
        return;
    }
}
}

```

OUTPUT:



```

Menu:
1)add
2)sub
3)mul
4)div
5)sqrt
6)power
7)mean
8)variance
9)GCD
Enter choice: 7
Please enter end to stop taking input: 12
45
8
5
end
Mean is 14.0
Enter how many numbers you want to enter:

```