CSA0980 -- PROGRAMMING IN JAVA FOR IDL TECHNOLOGY :-

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1.Create File1.txt file, in which, store more than one line of text. Write a Java program to count the no. of words, characters and lines from the input file File1.txt.

program

```
    import java.io.*;
public class Test {
public static void main(String[] args)
throws IOException
    {
        File file = new File("C:\Users\lenova\\TextReader.txt");
        FileInputStream fileInputStream = new FileInputStream(file);
        InputStreamReader inputStreamReader = new
InputStreamReader(fileInputStream);         BufferedReader bufferedReader = new
BufferedReader(inputStreamReader);

        String line;
     int wordCount= 0;
 int characterCount = 0;
 int paraCount = 0;
     int whiteSpaceCount = 0;         int sentenceCount = 0;

while ((line = bufferedReader.readLine()) != null) {
if (line.equals("")) {
 paraCount += 1;

 }

else {

characterCount += line.length();
String words[] = line.split("\\s+");                wordCount +=
words.length;                whiteSpaceCount += wordCount - 1;
               String sentence[] = line.split("[!?.:]+");
               sentenceCount += sentence.length;
            }
        }
        if (sentenceCount >= 1) {
           paraCount++;
        }
        System.out.println("Total word count = "+ wordCount);
```

```
        System.out.println("Total number of sentences = "+ sentenceCount);
        System.out.println("Total number of characters = "+ characterCount);
        System.out.println("Number of paragraphs = "+ paraCount);
        System.out.println("Total number of whitespaces = "+ whiteSpaceCount);
    }
}
```

2. Create Customer class with deposit() and withdraw() as synchronized methods. Declare AccountNo, AccName and Balance as Instance Variables inside the class. From the main class, Input the amount for withdraw() operation and if requested amount is not available in existing Balance amount, withdraw() method should be temporarily suspended using wait() method until deposit() method receives the input for amount, to be added in the existing Balance amount and then withdraw() would be completed in a successful manner. Develop the above scenario using Synchronization and Inter-Thread Communication.

Program

```
class Bank {

    // Initial balance $100
    int total = 100;
    void withdrawn(String name, int withdrawal)
    {
        if (total >= withdrawal) {
            System.out.println(name + " withdrawn "
                               + withdrawal);

            total = total - withdrawal;
            System.out.println("Balance after withdrawal: "
                               + total);
            // Making the thread sleep for 1 second after
            // each withdrawal

            // Try block to check for exceptions
            try {
                Thread.sleep(1000);
            }
            catch (InterruptedException e) {
            }
        }
        else {

            // Print statements
            System.out.println(name
                               + " you can not withdraw "
```

```
                            + withdrawal);

            System.out.println("your balance is: " + total);


            try {
                Thread.sleep(1000);
            }

            catch (InterruptedException e) {

                e.printStackTrace();
            }
        }
    }
    void deposit(String name, int deposit)
    {
        System.out.println(name + " deposited " + deposit);
        total = total + deposit;
        System.out.println("Balance after deposit: "+ total);
        try {
            Thread.sleep(1000);
        }
        catch (InterruptedException e) {
            e.printStackTrace();
        }
    }
}
class GFG {
    public static void main(String[] args)
    {
        Bank obj = new Bank();

        // Custom input - Transactions
        obj.withdrawn("Arnab", 20);
        obj.withdrawn("Monodwip", 40);
        obj.deposit("Mukta", 35);
        obj.withdrawn("Rinkel", 80);
        obj.withdrawn("Shubham", 40);
    }
}
```

Output

```
ode\User\workspaceStorage\394af9c188c02185fc2664d794063476\redhat.java\jdt_ws
Arnab withdrawn 20
Balance after withdrawal: 80
Monodwip withdrawn 40
Balance after withdrawal: 40
Mukta deposited 35
Balance after deposit: 75
Rinkel you can not withdraw 80
your balance is: 75
Shubham withdrawn 40
Balance after withdrawal: 35
PS C:\java1>
```

QUESTION 3:

```
class Solution {
    public List<String> fizzBuzz(int n)
    {
        List<String> result = new ArrayList<String>();
        for(int i=1;i<=n;i++){
    if(i%3==0 && i%5==0)
    {
        result.add("FizzBuzz");
    continue;
                }
               if(i%3==0)
               {
                result.add("Fizz");                c
               ontinue;
            }
    if(i%5==0)
    {
                    result.add("Buzz");
                    continue;
               }
               result.add(i+"");
            }
            return result;
        }
    }
```

6. Write a program to find whether the person is eligible for vote or not. And if that particular person is not eligible, then print how many years are left to be eligible.
Sample Input:
Enter your age: 7
Sample output:

You are allowed to vote after 11 years

Program

```
import java.util.Scanner;

public class Vote
{
    public static void main(String[] args)
    {
        int age;
        Scanner sc = new Scanner(System.in);
        System.out.print("Enter your age=");
        age = sc.nextInt();
        if (age >= 18)
        {
            System.out.println("You are eligible for vote.");
        }
        else
        {
            System.out.println("You are not eligible for vote.");
        }
    }
}
```

Output

```
a\AppData\Roaming\Code\User\workspaceStorage\394af9c188c
Enter your age=7
You are eligible for vote after 11 years
PS C:\java1>
```

7. Find the LCM and GCD of n numbers?

Sample Input:

N value = 2

Number 1 = 16

Number 2 = 20

Sample Output:

LCM = 80

GCD = 4

Program

```
import java.util.Scanner;

public class LcmGcd
    public static int gcd(int a, int b) {
        if (b == 0)
```

```
            return a;
        return gcd(b, a % b);
    }

    public static int lcm(int a, int b) {
        return (a * b) / gcd(a, b);
    }

    public static void main(String[] args) {
        Scanner sc = new Scanner(System.in);
        System.out.print("Enter the number of values: ");
        int n = sc.nextInt();
        int[] arr = new int[n];
        System.out.println("Enter the values: ");
        for (int i = 0; i < n; i++) {
            arr[i] = sc.nextInt();
        }
        int gcd = arr[0], lcm = arr[0];
        for (int i = 1; i < n; i++) {
            gcd = gcd(gcd, arr[i]);
            lcm = lcm(lcm, arr[i]);
        }
        System.out.println("LCM = " + lcm);
        System.out.println("GCD = " + gcd);
        sc.close();
    }
```

Output

```
ode\User\workspaceStorage\394af9c188c02185fc2664d79406347
Enter the number of values: 2
Enter the values:
16
20
LCM = 80
GCD = 4
```

8. Write a program using function to calculate the simple interest. Suppose the customer is a senior citizen. He is being offered 12 percent rate of interest; for all other customers, the ROI is 10 percent.

```
import java.util.Scanner;

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

```
        System.out.print("Enter the principal amount: ");
        double principal = scanner.nextDouble();

        System.out.print("Enter the no of years: ");
        int years = scanner.nextInt();

        System.out.print("Is customer senior citizen (y/n): ");
        String isSeniorCitizen = scanner.next();

        double rateOfInterest = isSeniorCitizen.equalsIgnoreCase("y") ? 0.12 :
0.10;
        double simpleInterest = principal * rateOfInterest * years;

        System.out.println("Interest: " + simpleInterest);
    }
}
```

Output

```
a\AppData\Roaming\Code\User\workspaceStorage\394af9c188c02185fc2664d79
Enter the principal amount: 200000
Enter the no of years: 3
Is customer senior citizen (y/n): n
Interest: 60000.0
PS C:\java1>
```

9. Write a program to print the Fibonacci series.
Sample Input:
Enter the n value: 6
Sample Output:
0 1 1 2 3 5

Program

```
Import java.util.*;
class fibonacci{
  public static void main(String[] args) {
scanner sc=new Scanner(System.in);
System.out.println(“enter the n value:”) ;
Int n=sc.nextInt();

    int  firstTerm = 0, secondTerm = 1;
    System.out.println("Fibonacci Series till " + n + " terms:");

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

```
      System.out.print(firstTerm + ", ");

      // compute the next term
      int nextTerm = firstTerm + secondTerm;
      firstTerm = secondTerm;
      secondTerm = nextTerm;
    }
  }
}
```

Output

```
enter n value:
6
Fibonacci Series till 6 terms:
0, 1, 1, 2, 3, 5,
PS C:\java1>
```

10. Java Program to Find Even Sum of Fibonacci Series Till number N?
Sample Input: n = 4
Sample Output: 33

Program

```
import java.util.Scanner;
import java.io.*;
public class FabonacciSum {
   public static void main(String[] args){
      int my_input, i, sum;
      System.out.println("Required packages have been imported");
      Scanner my_scanner = new Scanner(System.in);
      System.out.println("A reader object has been defined ");
      System.out.println("Enter the value of N: ");
      my_input = my_scanner.nextInt();
      int fabonacci[] = new int[2 * my_input + 1];
      fabonacci[0] = 0;
      fabonacci[1] = 1;
      sum = 0;
      for (i = 2; i <= 2 * my_input; i++) {
         fabonacci[i] = fabonacci[i - 1] + fabonacci[i - 2];
         if (i % 2 == 0)
            sum += fabonacci[i];
      }
      System.out.printf("Even sum of fibonacci series till number %d is %d" ,
my_input, sum);
   }
}
```

Output

```
ode\User\workspaceStorage\394af9c188c02185fc2664d79406347
Required packages have been imported
A reader object has been defined
Enter the value of N:
4
Even sum of fibonacci series till number 4 is 33
PS C:\java1>
```

11. Write a program to print the numbers from M to N by skipping K numbers in between?
Sample Input:
M = 50
N = 100
K = 7
Sample Output:
50, 58, 66, 74, …..

Program

```
public class SkipNumbers {
    public static void main(String[] args) {
        int m = 50;
        int n = 100;
        int k = 7;

        for (int i = m; i <= n; i += k) {
            System.out.print(i + ", ");
        }
    }
}
```

Output

```
enter the m value:
50
enter the n value:
100
enter the k value:
7
50, 57, 64, 71, 78, 85, 92, 99,
```

12. Write a program to print all the composite numbers between a and b?
Sample Input:
A = 12
B = 19

Sample Output
14, 15, 16, 18

Program

```
public class PrintCompositeNumbers {

    public static boolean isComposite(int num) {
        if (num <= 1) {
            return false;
        }
        for (int i = 2; i <= Math.sqrt(num); i++) {
            if (num % i == 0) {
                return true;
            }
        }
        return false;
    }

    public static void main(String[] args) {
        int a = 12;
        int b = 19;

        for (int i = a; i <= b; i++) {
            if (isComposite(i)) {
                System.out.print(i + ", ");
            }
        }
    }
}
```

Output

```
ode\User\workspaceStorage\394af9c188c02185fc2664d794063476\red
enter the a value:
12
enter the b value:
19
12, 14, 15, 16, 18,
PS C:\java1>
```

13. Find the factorial of n?
Sample Input:
N = 4
Sample Output:
4 Factorial = 24

Program

```
class FactorialExample{
    public static void main(String args[]){
     int i,fact=1;
     int number=5;//It is the number to calculate factorial
     for(i=1;i<=number;i++){
         fact=fact*i;
     }
       System.out.println("Factorial of "+number+" is: "+fact);
    }
```

Output

```
ode\User\workspaceStorage\394af9c188c0218
Factorial of 5 is: 120
PS C:\java1>
```

14. Find the year of the given date is leap year or not
Sample Input:
Enter Date: 04/11/1947
Sample Output:
Given year is Non Leap Year

Program

```
class Main {


    public static void main(String[] args) {

int year = 1900;
 boolean leap = false;

     if (year % 4 == 0) {

       if (year % 100 == 0) {

         if (year % 400 == 0)
leap = true;
else
leap = false;
        }

      else
```

```
        leap = true;
      }

      else       leap = false;

      if (leap)
        System.out.println(year + " is a leap year.");
      else
        System.out.println(year + " is not a leap year.");
    }
```

15. Find the number of factors for the given number
Sample Input:
Given number: 100
Sample Output:
Number of factors = 9

Program

```
public class Main {

  public static void main(String[] args) {

    // positive number
    int number = 60;

    System.out.print("Factors of " + number + " are: ");

    // loop runs from 1 to 60
    for (int i = 1; i <= number; ++i) {

      // if number is divided by i
      // i is the factor
      if (number % i == 0) {
        System.out.print(i + " ");
      }
    }
  }
}
```

Output

```
ode\User\workspaceStorage\394af9c188c02185fc2664d794063476\r
Factors of 60 are: 1 2 3 4 5 6 10 12 15 20 30 60
PS C:\java1>
```

16. Write a program to print the given number is Perfect number or not?
Sample Input:
Given Number: 6
Sample Output:
It's a Perfect Number

Program

```
import java.util.Scanner;
public class PerfectNumberExample1
{
public static void main(String args[])
{
long n, sum=0;
Scanner sc=new Scanner(System.in);
System.out.print("Enter the number: ");
n=sc.nextLong();
int i=1;
//executes until the condition becomes false
while(i <= n/2)
{
if(n % i == 0)
{
//calculates the sum of factors
Sum = sum + i;
} //end of if
//after each iteration, increments the value of variable i by 1
i++;
} //end of while
//compares sum with the number
if(sum==n)
{
//prints if sum and n are equal
System.out.println(n+" is a perfect number.");
} //end of if
else
//prints if sum and n are not equal
System.out.println(n+" is not a perfect number.");
}
}
```

Output

```
ode\User\workspaceStorage\394af9c188c02185fc2664
Enter the number: 6
Given number is a perfect number
PS C:\java1>
```

17. Write a program to find the square, cube of the given decimal number
Sample Input:
Given Number: 0.6
Sample Output:
Square Number: 0.36
Cube Number:0.216

Program

```java
import java.util.*;

public class j5 {
    public static void main(String args[]) {
        Scanner sc = new Scanner(System.in);
        int num;

        System.out.print("Enter an integer number: ");
        num = sc.nextInt();

        System.out.println("Square of " + num + " is: " + Math.pow(num, 2));
        System.out.println("Cube of " + num + " is: " + Math.pow(num, 3));
        System.out.println("Square Root of " + num + " is: " + Math.sqrt(num));
    }
}
```

Output

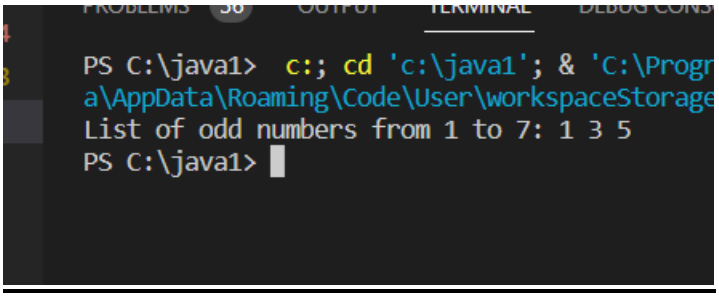
```
ode\User\workspaceStorage\394af9c188c02185fc2664d794063476\re
Enter an integer number: 12
Square of 12 is: 144.0
Cube of 12 is: 1728.0
Square Root of 12 is: 3.4641016151377544
PS C:\java1>
```

18. Find the n th odd number after n odd number
Sample Input: N : 7
Sample Output:
Hence the values printed for i are 1 , 3 , 5.

Program

```
public class oddnumber
{
public static void main(String args[])
{
int number=100;
System.out.print("List of odd numbers from 1 to "+number+": ");
for (int i=1; i<=number; i++)
{
if (i%2!=0)
{
System.out.print(i + " ");
}
}
}
}
```

output



19. Program to find the frequency of each element in the array.
Sample Input & Output:
{1, 2, 8, 3, 2, 2, 2, 5, 1}

Program

```
public class Frequency {
    public static void main(String[] args) {
        //Initialize array
        int [] arr = new int [] {1, 2, 8, 3, 2, 2, 2, 5, 1};
        //Array fr will store frequencies of element
        int [] fr = new int [arr.length];
        int visited = -1;
        for(int i = 0; i < arr.length; i++){
            int count = 1;
            for(int j = i+1; j < arr.length; j++){
                if(arr[i] == arr[j]){
                    count++;
                    //To avoid counting same element again
                    fr[j] = visited;
                }
```

```
            }
            if(fr[i] != visited)
                fr[i] = count;
        }

        //Displays the frequency of each element present in array
        System.out.println("---------------------------------------");
        System.out.println(" Element | Frequency");
        System.out.println("---------------------------------------");
        for(int i = 0; i < fr.length; i++){
            if(fr[i] != visited)
                System.out.println("    " + arr[i] + "    |    " + fr[i]);
        }
        System.out.println("---------------------------------------");
    }
}
```

Output

```
---------------------------------------
 Element | Frequency
---------------------------------------
    1    |    2
    2    |    4
    8    |    1
    3    |    1
    5    |    1
---------------------------------------
```

20. Program to find whether the given number is Armstrong number or not
Sample Input:

Enter number: 153
Sample Output:
Given number is Armstrong number

Program

```
public class Armstrong {

    public static void main(String[] args) {

        int number = 371, originalNumber, remainder, result = 0;

        originalNumber = number;
```

```
        while (originalNumber != 0)
        {
            remainder = originalNumber % 10;
            result += Math.pow(remainder, 3);
            originalNumber /= 10;
        }

        if(result == number)
            System.out.println(number + " is an Armstrong number.");
        else
            System.out.println(number + " is not an Armstrong number.");
    }
}
```

Output

```
PS C:\java1>  & 'C:\Program Files\Java\jdk-19\b
ode\User\workspaceStorage\394af9c188c02185fc266
enter the number:
153
153 is an Armstrong number.
PS C:\java1>
```

21. Write a program to find the sum of digits of N digit number (sum should be single digit)
Sample Input:
Enter N value: 3
Enter 3 digit numbers: 143

Program

```
import java.util.";

class HAPPY{

public static void main(String[] args){

int r, sum=0;

Scanner z = new Scanner(System.in); System.out.println("Enter N value:");

int Nz.nextInt();

System.out.println("Enter "+N+" digit number: ");
```

```
int a = z.nextInt();

while(a>0){

r = ax10;

Sum = sum+r;

a/=10;
}

System.out.println("Sum of "+N+" digit number:"+sum);
}
}
```

Output

```
Enter N value:
Enter 3 digit number:
Sum of 3 digit number:8
```

22. Write a program to find the square root of a perfect square number(print both the positive and negative values)
Sample Input:
Enter the number: 6561
Sample Output:
Square Root: 81, -81

Program

1.

```
import java.util.*;

class COOL{
public static void main(String[] args){
int m;
double p;
Scanner v = new Scanner(System.in);

System.out.println("enter the number : ");
 m = v.nextInt();
p = Math.sqrt(m);
 System.out.println("square root : " + p +" "-"+p);

 }
```

```
}
```

Output

```
PS C:\java1> & "C:\Program Files\Java\
ode\User\workspaceStorage\394af9c188c02
enter the number :
6561
square root : 81.0 ,-81.0
PS C:\java1>
```