SAVEETHA SCHOOL OF ENGINEERING

SAVEETHA INSTITUTE OF MEDICAL AND TECHNICAL SCIENCES

INSTITUTE OF PLACEMENT AND TRAINING

CSA09 –JAVA PROGRAMMING

String

1. Write a program to reverse a word using loop? (Not to use inbuilt functions)
   Sample Input:
   String: TEMPLE
   Sample Output:
   Reverse String: ELPMET
   Test cases:
   1. SIGN UP
   2. AT-LEAST
   3. 1245
   4. !@#$%
   5. 145*999=144855

Program :-

```
import java.util.*;
import java.util.Scanner;
public class wordrev {
public static void main(String[] args)
{
    try
    {

      Scanner input=new Scanner(System.in);
      System.out.println("Enter the string:");
      String word=input.nextLine();
      String empty="";
      int len=word.length();
      for(int i=len-1;i>=0;i--)
      {
        empty=empty+word.charAt(i);
      }
        System.out.println("reversed string:"+empty);
    }
    catch(Exception e)
    {
    System.out.print(" enter valid");
    }
}
}
```

2. Write a program to convent the given string to integer?
   Sample Input:
   String: 1234
   Sample Output:
   Out put String: 1234
   Test cases:
   1. 1267
   2. abc
   3. -1245
   4. !@#$%
   5. 145*999=144855

Program :-

```
class p2 {
   public static void main(String[] args) {
      String inputString = "1234";
      int outputInt = Integer.parseInt(inputString);
      System.out.println(outputInt);
   }
}
```

3. Write a program to check the entered user name is valid or not. Get both the inputs from the user.
   Sample Input:
   Enter the user name: Saveetha@789
   Reenter the user name: Saveetha@123
   Sample Output:
   User name is Invalid

Program :-

```
import java.util.*;
import java.util.Scanner;

public class username
{
public static void main(String[] args)
{
Scanner input = new Scanner(System.in);
System.out.println("enter username:");
String S1 = input.nextLine();
System.out.println("reenter username:");
String S2 = input.nextLine();
if (S1.equals(S2))
{
System.out.println("The user name is valid");
}
else
```

```
{
System.out.println("The user name is not valid");
}
}
}
```

4. Write a program that would sort a list of names in alphabetical order Ascending or Descending, choice get from the user?
   Sample Input:
   Banana
   Carrot
   Radish
   Apple
   Jack
   Order(A/D) : A
   Sample Output:
   Apple
   Banana
   Carrot
   Jack
   Radish

Program :-

```
import java.util.*;
import java.util.Scanner;
class sorting
{
public static void main(String[] args)
{
Scanner input = new Scanner(System.in);
System.out.println("Enter a or d:");
String arr[] = {"Banana", "Apple", "Carrot", "Radish", "Jack"};
int len = arr.length;
char order = input.next().charAt(0);
if ((order == 'A') || (order == 'a')) {
 for (int i = 0; i < len; i++) {
 for (int j = i + 1; j < arr.length; j++) {
 if (arr[i].compareTo(arr[j]) > 0) {
 String temp = arr[i];
 arr[i] = arr[j];
arr[j] = temp;
 }
 }
 }
 System.out.println(Arrays.toString(arr));
}
else if ((order == 'D') || (order =='d')) {
```

```
for (int i = 0; i < len; i++) {
for (int j = i + 1; j < arr.length; j++) {
if (arr[i].compareTo(arr[j]) < 0) {
String temp = arr[i];
arr[i] = arr[j];
arr[j] = temp;
}
}
}
System.out.println(Arrays.toString(arr));
}
}
}
```

5. Write a program to print the special characters separately and print number of Special characters in the line?

Program :-

```
import java.util.Scanner;

class splchar {
    private static Scanner sc;
    public static void main(String[] args) {
        String st;
        int i, alph, digi, spl;
        alph = digi = spl = 0;
        char ch;

        Scanner input = new Scanner(System.in);
        System.out.print("\nPlease Enter the String =  ");
        st = input.nextLine();

        for(i = 0; i <st.length(); i++)
        {
            ch = st.charAt(i);
            if(ch >= 'a' && ch <= 'z' || ch >= 'A' && ch <= 'Z' ) {
                alph++;
            }
            else if(ch >= '0' && ch <= '9') {
                digi++;
            }
            else {
                System.out.println(" "+st.charAt(i));
                spl++;
            }
        }
        System.out.println("Number of Special Characters   =  " + spl);
    }
```

}

6. Write a program to print the number of vowels in the given statement?

Sample Input:

Saveetha School of Engineering

Sample Output:

Number o vowels = 12

Test cases:

1. India is my country
2. All are my brothers and sisters
3. Why dry sky
4. Shy Try Cry
5. EDUCATION

Program :-

```
import java.util.Scanner;
class countingvowels {
  public static void main(String args[]){
    int count = 0;
    System.out.println("Enter a sentence :");
    Scanner input = new Scanner(System.in);
    String sentence = input.nextLine();

    for (int i=0 ; i<sentence.length(); i++){
      char ch = sentence.charAt(i);
      if(ch == 'a'|| ch == 'e'|| ch == 'i' ||ch == 'o' ||ch == 'u'||ch ==
'A'||ch=='E'||ch=='I'||ch=='O'||ch=='U'){
        count ++;
      }
    }
    System.out.println("Number of vowels in the given sentence is "+count);
  }
}
```

7. Write a program to print consonants and vowels separately in the given word

Sample Input:

Given Word: Engineering

Sample Output:

Consonants: n g n r n g

Vowels: e i e ei

Test cases:

1. TRY
2. MEDIAN
3. ONE
4. KNOWLEDGE
5. EDUCATION

Program :-

```
import java.util.Scanner;
class vowelsconsonants {
public static void main(String[] args)
{
Scanner input=new Scanner(System.in);
System.out.println("Enter the string: ");
String name=input.nextLine();
int len=name.length();
char a[]=new char[len];
char vow[]=new char[len];
char con[]=new char[len];
int v=0,c=0;
for(int i=0;i<len;i++)
{
 a[i]=name.charAt(i);
 if(a[i]=='a'||a[i]=='e'||a[i]=='i'||a[i]=='o'||a[i]=='u'
 ||a[i]=='A'||a[i]=='E'||a[i]=='I'||a[i]=='O'||a[i]=='U') {
 vow[v] = a[i];
 v++;
 }
 else {
 con[c] = a[i];
 c++;
 }
}
System.out.print("Vowels: ");
for(int i=0;i<v;i++)
{
 System.out.print(vow[i]);
}
System.out.print("\nConsonants: ");
for(int j=0;j<c;j++)
{
 System.out.print(con[j]);
}
}}
```

8. Write a program that finds whether a given character is present in a string or not. In case it is present it prints the index at which it is present. Do not use built-in find functions to search the character.

Sample Input:

Enter the string: I am a programmer

Enter the character to be searched: p

Sample Output:

P is found in string at index: 8

Note: Check for non available Character in the given statement as Hidden Test case.

Program :-

```
import java.util.Scanner;
class charstring {
public static void main(String[] args)
{
Scanner input=new Scanner(System.in);
System.out.println("Enter the string");
String str=input.nextLine();
System.out.println("Enter character: ");
char c=input.next().charAt(0);
char arr[]=new char[str.length()];
int len=str.length();
int x=0;
for(int i=0;i<len;i++)
{
 arr[i]=str.charAt(i);
 if(arr[i]==c)
 {
 System.out.println(c+" is found in string at index: "+(i+1));
 x=1;
 }
}
if(x==0)
 System.out.print("character not found");
}}
```

9. Write a program to arrange the letters of the word alphabetically in reverse order

Sample Input:

Enter the word: MOSQUE

Sample Output:

Alphabetical Order: U S Q O M E

Test Case:

1. HYPOTHECATION
2. MATRICULATION
3. MANIPULATION

Program :-

```
import java.util.Scanner;
import java.util.Arrays;
class revalpha {
public static void main(String args[])
{
 Scanner input=new Scanner(System.in);
 System.out.print("Enter string: ");
```

```
        String name=input.nextLine();
        int len=name.length();
        char arr[]=new char[len];
        String Alpha;
        for(int i=0;i<len;i++)
        {
        arr[i]=name.charAt(i);
        }
        System.out.print("Reverse string is:");
        Arrays.sort(arr);
        for(int i=len-1;i>=0;i--)
        {
        System.out.print(arr[i]+" ");
        }
        }
}
```

10. Write a program that accepts a string from user and displays the same string after removing vowels from it.

Sample Input & Output:

Enter a string: we can play the game

The string without vowels is: w cn ply thgm

Program :-

```
import java.util.Scanner;
class removevowels {
public static void main(String[] args)
{
Scanner input=new Scanner(System.in);
System.out.print("Enter the string: ");
String name=input.nextLine();
System.out.print("String after replacing vowels: ");
String n1=name.replaceAll("[aeiouAEIOU]","");
System.out.println(n1);
}
}
```

Arrays:

11. Write a program for matrix multiplication?

Sample Input:

Mat1 = 1 2
5 3

Mat2 = 2 3
4 1

Sample Output:

Mat Sum = 10 5

22 18

Program :-

```
import java.util.*;
import java.util.Scanner;
class matrixmul {
public static void main(String[] args)
{
try
{
Scanner input=new Scanner(System.in);
System.out.print("Enter no.of rows:");
int r=input.nextInt();
System.out.print("Enter no.of columns:");
int c=input.nextInt();
System.out.println("enter matrix 1");
int mat1[][]=new int[r][c];
int mat2[][]=new int[r][c];
 for(int i=0;i<r;i++)
 {
 for(int j=0;j<c;j++)
 {
 mat1[i][j]=input.nextInt();
 } }
 System.out.println("enter matrix 2");
 for(int i=0;i<r;i++) {
 for(int j=0;j<c;j++)
 {
 mat2[i][j]=input.nextInt();
 } }
 System.out.println("Multiplied matrix");
 int sum[][]=new int[r][c];
 for(int i=0;i<r;i++) {
 for(int j=0;j<c;j++) {
 sum[i][j]=0;
 for(int k=0;k<c;k++)
 {
 sum[i][j] = sum[i][j] +(mat1[i][k]*mat2[k][j]);
 }
 System.out.print(sum[i][j] + "\t");
 }
 System.out.println();
 }
}
catch(Exception e)
{
System.out.println(" enter valid");
```

```
}
}}
```

12. Write a program for matrix addition?

Sample Input:

```
Mat1 =   1  2
         5  3
Mat2 =   2  3
         4  1
```

Sample Output:

```
Mat Sum = 3   5
          9   4
```

Program :-

```
import java.util.*;
import java.util.Scanner;
public class matrixadd
{
 public static void main(String[] args)
 {
 int p, q, m, n;
 Scanner s = new Scanner(System.in);
 System.out.print("Enter number of rows in first matrix:");
 p = s.nextInt();
 System.out.print("Enter number of columns in first matrix:");
 q = s.nextInt();
 System.out.print("Enter number of rows in second matrix:");
 m = s.nextInt();
 System.out.print("Enter number of columns in second matrix:");
 n = s.nextInt();
 if (p == m && q == n)
 {
 int a[][] = new int[p][q];
 int b[][] = new int[m][n];
 int c[][] = new int[m][n];
 System.out.print("Enter all the elements of first matrix:");
 for (int i = 0; i < p; i++)
 {
 for (int j = 0; j < q; j++)
 {
 a[i][j] = s.nextInt();
 }
 }
 System.out.println("Enter all the elements of second matrix:");
 for (int i = 0; i < m; i++)
 {
 for (int j = 0; j < n; j++)
```

```
{
b[i][j] = s.nextInt();
}
}
for (int i = 0; i < p; i++)
{
for (int j = 0; j < n; j++)
{
for (int k = 0; k < q; k++)
{
c[i][j] = a[i][j] + b[i][j];
}
}
}
System.out.println("Matrix after addition:");
for (int i = 0; i < p; i++)
{
for (int j = 0; j < n; j++)
{
System.out.print(c[i][j]+" ");
}
System.out.println("");
}
}
else
{
System.out.println("Addition would not be possible");
}
}
}
```

13. Write a program for Merge two sorted arrays using Array list

Input: arr1[] = { 1, 3, 4, 5}, arr2[] = {2, 4, 6, 8}

Output: arr3[] = {1, 2, 3, 4, 4, 5, 6, 8}

Program :-

```
import java.util.*;

class merge2arrays {
   public static void main(String[] args) {
      int arr1[] = {1, 3, 5, 7};
      int n1 = arr1.length;
      int arr2[] = {2, 4, 6, 8};
      int n2 = arr2.length;
      int arr3[] = new int[n1 + n2];
      mergeArrays(arr1, arr2, n1, n2, arr3);
      System.out.println("Array after merging");
      for (int i=0; i < n1+n2; i++)
```

```
        System.out.print(arr3[i] + " ");

    }

    public static void mergeArrays(int[] arr1, int[] arr2, int n1, int n2, int[] arr3){
        int i = 0;
        int j = 0;
        int k = 0;
        while(i < n1){
         arr3[k++] = arr1[i++];
        }
        while(j < n2){
         arr3[k++] = arr2[j++];
        }
        Arrays.sort(arr3);
    }
}
```

14. Find the Mean, Median, Mode of the array of numbers?

Sample Input;:

Array of elements = {16, 18, 27, 16, 23, 21, 19}

Sample Output:

Mean = 20

Median = 19

Mode = 16

Test cases:

1. Array of elements = {26, 28, 37, 26, 33, 31, 29}
2. Array of elements = {1.6, 1.8, 2.7, 1.6, 2.3, 2.1, .19}
3. Array of elements = {0, 160, 180, 270, 160, 230, 210, 190, 0}
4. Array of elements = {200, 180, 180, 270, 160, 270, 270, 190, 200}
5. Array of elements = {100, 100, 100, 100, 100, 100, 100, 100, 100}

Program :-

```
import java.util.*;
import java.util.Scanner;
public class mmm
{
public static void main(String[] args)
{
Scanner input=new Scanner(System.in);
System.out.print("Enter Size of array: ");
int n=input.nextInt();
int[] a=new int[20];
System.out.print("Enter elements of array: ");
for(int i=0;i<n;i++)
{
a[i]=input.nextInt();
}
```

```
int sum=0;
for(int i=0;i<n;i++)
{
 sum=sum+a[i]; }
int mean=sum/n;
System.out.println("mean: "+mean);
for(int i=0;i<n;i++)
{
 for(int j=i+1;j<n;j++)
 {
 if(a[i]>a[j])
 {
 int temp=a[i];
 a[i]=a[j];
 a[j]=temp;
 }
 } }
for(int i=0;i<n;i++)
{
 if(n%2==0)
 {
 int mid=n/2;
 System.out.print("median: "+a[mid-1]);
 break;
 }
 else
 {
 int mid=(n+1)/2;
 System.out.println("median: "+a[mid-1]);
 break;
 } }
for(int i=0;i<n;i++)
{
 for(int j=i+1;j<n;j++)
 {
 if(a[i]==a[j])
 {
 System.out.println("mode: "+a[i]);
 break;
 }
 }
}
}
}
```

15. Write a program to find the number of composite numbers in an array of elements

Sample Input;:

Array of elements = {16, 18, 27, 16, 23, 21, 19}

Sample Output:

Number of Composite Numbers = 5

Test cases:

1. Array of elements = {26, 28, 37, 26, 33, 31, 29}
2. Array of elements = {1.6, 1.8, 2.7, 1.6, 2.3, 2.1, .19}
3. Array of elements = {0, 160, 180, 270, 160, 230, 210, 190, 0}
4. Array of elements = {200, 180, 180, 270, 270, 270, 190, 200}
5. Array of elements = {100, 100, 100, 100, 100, 100, 100, 100}

Program :-

```
import java.util.Scanner;
class countcomposite {
public static void main(String[] args)
{
Scanner input=new Scanner(System.in);
System.out.print("Enter Size of array: ");
int n=input.nextInt();
int[] arr=new int[100];
System.out.print("Enter array elements: ");
for(int i=0;i<n;i++)
{
arr[i]=input.nextInt();
}
int count=0;
for(int i=0;i<n;i++)
{
 int c=0;
 for(int j=1;j<100;j++)
 {
 if(arr[i]%j==0)
 {
 c++;
 }
 }
 if(c>2)
 count++;
}
System.out.println("The composite numbers are: "+count);
}}
```

Patterns :

16. Write a program to print Right Triangle Star Pattern

Sample Input:: n = 5

Output:

```
    *
   * *
  * * *
 * * * *
* * * * *
```

Program :-

```
import java.util.*;
import java.util.Scanner;
class righttri {
   public static void main(String args[])
   {
      Scanner sc = new Scanner(System.in);
      System.out.println("Enter the number of lines:");
      int n=sc.nextInt();
      int a, b;
      for(a = 0; a < n; a++) {
         for(b = 0; b <= a; b++) {
            System.out.print("* ");
         }
         System.out.println();
      }
   }}
```

17. Write a program to print the below pattern?

```
                1
              1   1
            1   2   1
          1   3   3   1
        1   4   6   4   1
```

Program :-

```
import java.util.*;
import java.util.Scanner;
public class pattern17
{
   public static void main(String[] args)
   {
      Scanner input=new Scanner(System.in);
      System.out.println("Enter the number of lines:");
      int n=input.nextInt();
      for(int i=1;i<=n;i++)
      {
         int a=1;
         for(int s=1;s<=n-i;s++)
         {
```

```
            System.out.print(" ");
        }
        for(int j=1;j<=i;j++)
        {
            System.out.print(a+" ");
            a=a*(i-j)/j;
        }
        System.out.println();
    }
}}
```

18. Write a program to print rectangle symbol pattern.

Get the symbol as input from user

Program :-

```
import java.util.*;
import java.util.Scanner;

class recpattern {
   public static void main(String[] args)
   {
      int rows, columns, i, j;
      Scanner a= new Scanner(System.in);
      Scanner b=new Scanner(System.in);
      System.out.println("Enter Number of Rows : ");
      int r = a.nextInt();

      System.out.println("Enter Number of Columns : ");
      int c = a.nextInt();
         System.out.println("enter the symbol");

         String s=b.nextLine();

      for(i = 1; i <= r; i++)
      {
         for(j = 1; j <= c; j++)
         {System.out.print(s+"");
         }
         System.out.print("\n");
      }
   }
}
```

19. Write a program to print the following pattern

Sample Input:

Enter the number to be printed: 1

Max Number of time printed: 3

1

11
111
11
1

Program :-

```
import java.util.*;
import java.util.Scanner;
public class onepattern
{
public static void main(String[] args)
{
Scanner input=new Scanner(System.in);
System.out.print("Enter the number to be printed: ");
int x=input.nextInt();
System.out.print("Max Number of time printed: ");
int n=input.nextInt();
for(int i=1;i<=n;i++)
{
 for(int j=1;j<=i;j++)
 {
 System.out.print(x);
 }
 System.out.println();
}
for(int i=n-1;i>=1;i--)
{
 for(int j=1;j<=i;j++)
 {
 System.out.print(x);
 }
 System.out.println();
}
}
}
```

20. Write a program to print the Inverted Full Pyramid pattern?

Program :-

```
import java.util.*;
import java.util.Scanner;
class invpyramid
{
public static void main(String[] args)
{
Scanner input=new Scanner(System.in);
System.out.println("enter no.of rows");
int n=input.nextInt();
for(int i=n;i>=1;i--) {
```

```
 for(int j=0;j<n-i;j++)
 {
 System.out.print(" ");
 }
 for(int k=1;k<=i;k++)
 {
 System.out.print(" *");
 }
 System.out.println();
}
}
}
```

21. Write a program to print the following pattern

Sample Input:
Enter the Character to be printed: %
Max Number of time printed: 3

```
%
% %
% % %
```

Program :-

```
import java.util.*;
import java.util.Scanner;
class pattern21
{
public static void main(String[] args)
{
Scanner input=new Scanner(System.in);
System.out.print("Enter the character to be printed: ");
String x=input.nextLine();
System.out.print("Max Number of time printed: ");
int n=input.nextInt();
for(int i=1;i<=n;i++)
{
 for(int j=1;j<=i;j++)
 {
 System.out.print(x);
 }
 System.out.print("\n");
}
}
}
```

22. Write a program to print hollow square symbol pattern?

Program :-

```
import java.util.*;
import java.util.Scanner;
class pattern22
```

```
{
public static void main(String[] args)
{
Scanner input=new Scanner(System.in);
Scanner ip=new Scanner(System.in);
System.out.print("enter the no of rows: ");
int n=input.nextInt();
System.out.print("enter the symbol : ");
String x=ip.nextLine();
int i,j;
for(i=1;i<=n;i++)
{
for(j=1;j<=n;j++)
{
if(i==1||i==n||j==1||j==n)
{
 System.out.print(x+" ");
}
else
System.out.print("  ");
}
System.out.println();
}
}
}
```

23. Write a program to print the below pattern

```
1
2 2
3 3 3
4 4  4  4
```

Pattern :-

```
import java.util.*;
import java.util.Scanner;
class pattern23
{
public static void main(String[] args)
{
Scanner input=new Scanner(System.in);
System.out.print("enter the no of rows: ");
int n=input.nextInt();
for(int i=1;i<=n;i++)
{
 for(int j=1;j<=i;j++)
 {
 System.out.print(i);
 }
```

```
 System.out.print("\n");
}
}
}
```

24. Write a program to print the below pattern

```
1
4    9
16   25    36
49   64    81    100
```

Program :-

```
import java.util.*;
import java.util.Scanner;
class pattern24
{
public static void main(String[] args)
{
Scanner input=new Scanner(System.in);
System.out.println("Enter the number of rows:");
int n=input.nextInt();
int k=1;
for(int i=1;i<=n;i++)
{
 for(int j=1;j<=i;j++)
 {
 System.out.print(k*k+" ");
 k++;
 }
 System.out.print("\n");
}
}
}
```

25. Write a program to print the below pattern

```
1
2 2
3  3  3
4  4   4   4
3  3  3
2  2
1
```

Program :-

```
import java.util.*;
import java.util.Scanner;
class pattern25
{
public static void main(String[] args)
{
```

```
Scanner input=new Scanner(System.in);
System.out.print("enter the no of rows: ");
int n=input.nextInt();
for(int i=1;i<=n;i++)
{
 for(int j=1;j<=i;j++)
 {
 System.out.print(i);
 }
 System.out.println();
}
for(int i=n-1;i>=1;i--)
{
 for(int j=1;j<=i;j++)
{
 System.out.print(i);
}
System.out.println();
}
}
}
```

26. Write a program to print hollow Square Dollar pattern?

Program :-

```
import java.util.*;
import java.util.Scanner;
class squaredollar
{
public static void main(String[] args)
{
Scanner input=new Scanner(System.in);
System.out.print("enter the no of rows: ");
int n=input.nextInt();
int i,j;
for(i=1;i<=n;i++)
{
for(j=1;j<=n;j++)
{
if(i==1||i==n||j==1||j==n)
{
 System.out.print("$");
}
else
System.out.print(" ");
}
System.out.println();
}
```

```
        }
}
```

27. Write a program to print inverted pyramid pattern.

Input: no of rows: 3

Output

```
*****

 ***

  *
```

Program :-

```
import java.util.Scanner;

public class invp {
   public static void main(String[] args) {
      Scanner input = new Scanner(System.in);
      System.out.print("Enter the number of rows: ");
      int n = input.nextInt();
      for (int i = n; i >= 1; i--) {
         for (int j = n - i; j > 0; j--) {
            System.out.print("  ");
         }
         for (int k = i * 2 - 1; k > 0; k--) {
            System.out.print(" *");
         }
         System.out.println();
      }
   }
}
```

General:

28. Write a program to reverse a number using loop?(Get the input from user)

Sample Input:

Number: 14567

Sample Output:

Reverse Number: 76541

Test cases:

1. -45721
2. 000
3. AD1947
4. !@#$%
5. 145*999=144855

Program :-

```
import java.util.*;
import java.util.Scanner;
class numrev
{
```

```
public static void main(String[]arg)
{
    try
    {

       Scanner input=new Scanner(System.in);
       System.out.println("Enter the number:");
       int n=input.nextInt();
       int rev=0;
       while(n!=0)
       {
         int rem=n%10;
         rev=rev*10+rem;
         n=n/10;
       }
          System.out.println("The reversed number is:");
          System.out.print(rev);

    }
    catch(Exception e)
    {
    System.out.print(" enter valid");
    }
}
}
```

29. Write a program to convert the given decimal to binary and print the reverse of the binary decimal.

Input: 11

Output: 13

Explanation: (11)10 = (1011)2.

After reversing the bits we get:

(1101)2 = (13)10.

Test cases:

1. 25
2. Eighteen
3. 12
4. -18
5. 34.5

Program :-

```
import java.util.Scanner;
class dectobintodec
{
 public static void main(String[] args)
 {
        Scanner input=new Scanner(System.in);
        System.out.print("Enter the decimal: ");
```

```
            int n=input.nextInt();
            int num=Integer.parseInt(Integer.toBinaryString(n));
            int rev=0;
            while(num!=0)
            {
                  int r=num%10;
                  rev=rev*10+r;
                  num=num/10;
            }
            String rnum=Integer.toString(rev);
            int i=Integer.parseInt(rnum,2);
            System.out.print("Reverse of binary: "+i);
      }
}
```

30. 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

Test cases:

6. 25
7. Eighteen
8. 12
9. -18
10. 34.5

Program :-

```
import java.util.*;
import java.util.Scanner;
public class voting {
public static void main(String[] args)
{
    try
    {

      Scanner input=new Scanner(System.in);
      System.out.println("Enter the age:");
      int age=input.nextInt();
      if(age>18){
      System.out.print("you are eligible for vote");
      } else if(age<=0) {
         System.out.print("Enter the age correctly");
      }
      else
         System.out.print("you are eligible to vote after"+(18-age));
    }
```

```
    catch(Exception e)
    {
    System.out.print(" enter valid");
    }
}
}
```

31. 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

Test cases:

1. N = 3, {12, 25, 30}
2. N = 2, {52, 25, 63}
3. N = 3, {17, 19, 11}
4. N = -2, {52, 60}
5. N = 2, {30, 45}

Program :-

```
import java.util.*;
class lcmgcd {
public static void main(String[] args)
{
 Scanner input = new Scanner(System.in);
 System.out.print("enter N value:-");
 int n = input.nextInt();

 System.out.print("Number 1:- ");
 int num1 = input.nextInt();
 System.out.print("Number 2:- ");
 int num2 = input.nextInt();
 int small = (num1<num2)?num1:num2;
 int count = 1,gcd=0;
 while(count<=small){
 if(num1%count==0 && num2%count==0){
 gcd = count;
 }
 count++;
 }
 int lcm = (num1*num2)/gcd;
 System.out.println("the GCD is:- "+gcd);
 System.out.println("the LCM is:- "+lcm);
```

```
 }
}
```

32. 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.

Sample Input:

Enter the principal amount: 200000
Enter the no of years: 3
Is customer senior citizen (y/n): n

Sample Output:

Interest: 60000

Test Cases:

1. Principal: 2000 , Years: 0
2. Principal: 20000 , Years: -2
3. Principal: -2000 , Years: 2
4. Principal: 2 , Years: 2000
5. Principal: 0 , Years: 5

Program :-

```
import java.util.*;
import java.util.Scanner;
class intrest
{
public static void main(String[] args)
{
    try
    {
        Scanner input = new Scanner(System.in);
        System.out.println("Enter the principle amount:");
        int pri=input.nextInt();
        System.out.println("Enter the number of years:");
        int year=input.nextInt();
        System.out.println("Is senior citizen y/n:");
        char age=input.next().charAt(0);
        double intrest=0.0;
        if(age=='y')
        {
            intrest=(pri*year*0.12)/100;
            System.out.print(intrest);
        }
        else
        {
            intrest=(pri*year*0.1);
            System.out.print(intrest);
        }
    }
    catch(Exception e)
```

```
    {
        System.out.print(" enter valid");
    }
}
}
```

33. 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.*;
import java.util.Scanner;
class fiboseries {
public static void main(String[] args)
{
Scanner input=new Scanner(System.in);
System.out.print("Enter the n value: ");
int n=input.nextInt();
int a1=0,a2=1;
for(int i=0;i<n;i++)
{
 System.out.print(a1+" ");
 int a3=a1+a2;
 a1=a2;
 a2=a3;
}
}}
```

34. Java Program to Find Even Sum of Fibonacci Series Till number N?

Sample Input: n = 4

Sample Output: 33

(N = 4, So here the fibonacci series will be produced from 0th term till 8th term:0, 1, 1, 2, 3, 5, 8, 13, 21

Sum of numbers at even indexes = 0 + 1 + 3 + 8 + 21 = 33)

Program :-

```
import java.util.Scanner;
import java.io.*;
class evensumfibbo {
 public static void main(String[] args){
 Scanner input= new Scanner(System.in);
 System.out.print("Enter N: ");
 int n=input.nextInt();
 int fib[] = new int[2*n+1];
 fib[0] = 0;
 fib[1] = 1;
 int sum = 0;
```

```
for (int i = 2; i <= 2 *n; i++) {
fib[i] = fib[0] + fib[1];
fib[0]=fib[1];
fib[1]=fib[i];
if (i % 2 == 0)
sum =sum + fib[i];
}
System.out.print("Even sum of fibonacci series is:" +sum);
} }
```

35. 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, …..

Test cases:

1. M = 15, N = 05, K = 02
2. .M = 25, N = 50, K = 04
3. M = 15, N = 100, K = -02
4. M = 0 , N = 0 , K = 2
5. M = 200 , N = 200 , K = 50

Program :-

```
import java.util.*;
import java.util.scanner;
class skippingk
{
public static void main(String[] args) {
Scanner obj=new Scanner(System.in);
System.out.print("M=");
int m=obj.nextInt();
System.out.print("N=");
int n=obj.nextInt();
System.out.print("K=");
int k=obj.nextInt();
while(m<=n)
{
 System.out.println(m);
 m=m+k+1;
}
}
}
```

36. 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

Test cases:

1. A = 11, B = 11
2. A = 20, B = 10
3. A = 0, B = 0
4. A = -5, B = 5
5. A = 7, B = -12

Program :-

```
import java.util.*;
import java.util.Scanner;
class compositenum {
public static void main(String[] args)
{
try
{
Scanner input=new Scanner(System.in);
System.out.print("Enter the number a:");
int a=input.nextInt();
System.out.print("Enter the number b:");
int b=input.nextInt();
for(int i=a+1;i<b;i++)
{
int c=0;
for(int j=1;j<b;j++)
{
if(i%j==0)
c++;
}
if(c>2)
System.out.print(i+" ");
}
}
catch(Exception e)
{
System.out.println(" enter valid");
}
}}
```

37. Find the factorial of n?

Sample Input:

N = 4

Sample Output:

4 Factorial = 24

Test cases:

1. N = 0
2. N = -5

3. N = 1
4. N = Q
5. N = 3A

Program :-

```
import java.util.Scanner;
class factorial {
public static void main(String[] args)
{
Scanner input=new Scanner(System.in);
System.out.print("Enter the n value: ");
int n=input.nextInt();
int fact=1;
for(int i=1;i<=n;i++)
{
 fact=fact*i;
}
System.out.print(n+" factorial = "+fact);
}}
```

38. 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

Test cases:

1. 04/11/19.47
2. 11/15/1936
3. 31/45/1996
4. 64/09/1947
5. 00/00/2000

Program :-

```
import java.util.Scanner;
class leapyear {
 public static void main(String[] args)
 {
 try
 {
 Scanner input=new Scanner(System.in);
 System.out.print("Enter year: ");
 String year=input.next();
 String a[]=year.split("/");
 String d=a[2];
 int num=Integer.parseInt(d);
 if((num%4==0 && num%100!=0)|| num%400==0)
 System.out.println("It is a leap year");
 else
 System.out.println("Not a leap year");
```

```
}
catch(Exception e)
{
System.out.println(" enter valid");
}
}}
```

39. Find the number of factors for the given number

Sample Input:

Given number: 100

Sample Output:

Number of factors = 9

Test cases:

1. 343
2. 1080
3. -243
4. 101010
5. 0

Program :-

```
import java.util.Scanner;
class numoffactors {
public static void main(String[] args)
{
try
{
Scanner input=new Scanner(System.in);
System.out.print("Enter n: ");
int n=input.nextInt();
int factors=0;
for(int i=1;i<=n;i++)
{
 if(n%i==0)
 factors=factors+1;
}
System.out.print("Number of factors = "+factors);
}
catch(Exception e)
{
System.out.println(" enter valid");
}
}}
```

40. 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

Test cases:

1. 17
2. 26!
3. 143
4. 84.1
5. -963

Program :-

```
import java.util.*;
import java.util.Scanner;
class perfectnum
{
public static void main(String args[])
{
try
{
int n, sum=0;
Scanner sc=new Scanner(System.in);
System.out.print("Enter the number: ");
n=sc.nextInt();
int i=1;
while(i <= n/2)
{
if(n % i == 0)
{
sum = sum + i;
}
i++;
}
if(sum==n)
{
System.out.println(n+" is a perfect number.");
}
else
System.out.println(n+" is not a perfect number.");
}
catch(Exception e)
{
System.out.println(" enter valid number");
}
}
}
```

41. 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

Test cases:

1. 12
2. 0
3. -0.5
4. 14.25
5. -296

Program :-

```
import java.util.Scanner;
class sqcube {
public static void main(String[] args)
{
try
{
Scanner input=new Scanner(System.in);
System.out.print("Enter the number: ");
float n=input.nextFloat();
System.out.println("square: "+(n*n));
System.out.println("cube: "+(n*n*n));
}
catch(Exception e)
{
System.out.println(" enter valid");
}
}}
```

42. 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.

Test cases:

1. N = 0
2. N = -6
3. N = 2021
4. N = -14.5
5. N = -196

Program :-

```
import java.util.Scanner;
class nthodd {
public static void main(String[] args)
{
try
{
Scanner input=new Scanner(System.in);
System.out.print("Enter N: ");
```

```
        int n=input.nextInt();
        int arr[]=new int[100];
        int j=1;
        for(int i=1;i<100;i++)
        {
         if(i%2!=0) {
         arr[j] = i;
         j++;
         }
        }
        System.out.print("The odd number is: "+arr[n*2]);
        }
        catch(Exception e)
        {
        System.out.println(" enter valid");
        }
}}
```

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

Pseudo:

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

Program:-

```
        import java.util.Arrays;
        import java.util.Scanner;
        public class elementfreq
        {
        public static void main(String[] args)
        {
        Scanner input=new Scanner(System.in);
        int a[]=new int[] {1,2,8,3,2,2,2,5,1};
        int t[]=new int[a.length];
        System.out.println("element |  frequency");
        int visited=-1;
        for(int i=0;i<a.length;i++)
        {
        int count=1;
        for(int j=i+1;j<a.length;j++)
        {
```

```
        if(a[i]==a[j])
        {
        count++;
        t[j]=visited;
        }
        }
        if(t[i]!=visited)
        t[i]=count;
        }
        for(int i=0;i<a.length;i++)
        {
        if(t[i]!=visited)
        System.out.println(a[i]+"      |     "+t[i]);
        }
        }
}
```

43. Program to find whether the given number is Armstrong number or not

Sample Input:

Enter number: 153

Sample Output:

Given number is Armstrong number

Test cases:

1. 370
2. 1
3. 371
4. 145678
5. 0.21345

Program :-

```
import java.util.*;
import java.util.Scanner;
class armstrongnum
{
public static void main(String[] args)
{
try
{
Scanner input=new Scanner(System.in);
System.out.print("enter a number:");
int n=input.nextInt();
int N=n;
int a=0;
while(N!=0)
{
int rem=N%10;
a=a+(rem*rem*rem);
N=N/10;
```

```
}
if(n==a)
System.out.print("Given number is Armstrong number");
else
System.out.print("given number is Not an Armstrong");
}
catch(Exception e)
{
System.out.print(" enter valid");
}
}
}
```

44. 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

Test cases:

1. N = 2, 158
2. N = 3, 14
3. N = 4, 0148
4. N = 1, 0004
5. N = 4, 7263

Program :-

```
import java.util.*;
import java.util.Scanner;
class digitsum {
public static void main(String[] args)
{
    try
    {
        Scanner input=new Scanner(System.in);
        System.out.print("Enter the number:");
        int n=input.nextInt();
        int sum=0;
        while(n!=0)
        {
        int rem=n%10;
        sum=sum+rem;
        n=n/10;
        }
        System.out.print("Sum is:"+sum);
    }
    catch(Exception e)
    {
    System.out.println(" enter valid");
    }
```

}}

45. 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

Test cases:

1. 1225
2. 9801
3. 1827
4. -100
5. 0

Program :-

```
import java.util.*;
import java.util.Scanner;
import java.lang.Math;
public class sqroot {
public static void main(String args[])
{
    try
    {
       Scanner input=new Scanner(System.in);
       System.out.print("Enter the number:");
       double n=input.nextInt();
       double sqrt=Math.pow(n,0.5);
       double sq=Math.sqrt(n);
       System.out.println("Square root of perfect number is:"+sqrt+","+"-"+sqrt);
    }
    catch(Exception e)
    {
    System.out.println(" enter valid");
    }
}}
```

46. Write a program to given an integer n, return true if it is a power of three. Otherwise, return false.

Input =27

Output= true

Explanation: $27=3^3$

Test cases:

1. 12
2. abc@45
3. 1827
4. -100
5. 0

Program:-

```
import java.util.Scanner;
class threepower {
  public static boolean isPowerOfThree(int n) {
    if(n<3)
      return false;

    while(n%3==0)
    {
      n/=3;
    }

    return n==1;
  }
  public static void main(String[] args){
  try {
  Scanner input=new Scanner(System.in);
  System.out.print("Enter the number: ");
  int n=input.nextInt();
  if (isPowerOfThree(n))
      System.out.println("True");
    else
      System.out.println("False");
 }
catch(Exception e)
{
System.out.println(" enter valid");
}
}}
```

47. Write a program to given a string paragraph and a string array of the banned words banned, return the most frequent word that is not banned. It is guaranteed there is at least one word that is not banned, and that the answer is unique.

Input Paragraph=”Ram hit a ball, the hit ball flew far after it was hit”,
Banned = [hit]
Output=”Ball”

Program :-

```
import java.util.*;

public class banned {

   public static String findMostFrequentWord(String paragraph, String[] banned) {
      String[] words = paragraph.toLowerCase().split("[^a-zA-Z]+");

      Map<String, Integer> wordFreq = new HashMap<>();
```

```
        for (String word : words) {
            if (!Arrays.asList(banned).contains(word)) {
                wordFreq.put(word, wordFreq.getOrDefault(word, 0) + 1);
            }
        }

        String mostFrequentWord = "";
        int maxFreq = 0;
        for (Map.Entry<String, Integer> entry : wordFreq.entrySet()) {
            if (entry.getValue() > maxFreq) {
                mostFrequentWord = entry.getKey();
                maxFreq = entry.getValue();
            }
        }

        return mostFrequentWord;
    }

    public static void main(String[] args) {
        String paragraph = "Ram hit a ball, the hit ball flew far after it was hit";
        String[] banned = {"hit"};
        String mostFrequentWord = findMostFrequentWord(paragraph, banned);
        System.out.println(mostFrequentWord);
    }
}
```

48. Write a program to given a fixed-length integer array arr, duplicate each occurrence of zero, shifting the remaining elements to the right.
Input: arr = [1, 0, 2, 3, 0, 4, 5, 0]
Output: [1, 0, 0, 2, 3, 0, 0, 4]
Explanation: After calling your function, the input array is modified to [1, 0, 0, 2, 3, 0, 0, 4]

Program :-

```
import java.util.*;
public class shiftele {
    public static void duplicateZeros(int[] arr) {
        int len = arr.length;
        for (int i = 0; i < len; i++) {
            if (arr[i] == 0) {
                for (int j = len - 1; j > i; j--) {
                    arr[j] = arr[j - 1];
                }
                if (i + 1 < len) {
                    arr[i + 1] = 0;
                    i++;
                }
            }
```

```
    }
  }

  public static void main(String[] args) {
    int[] arr = {1, 0, 2, 3, 0, 4, 5, 0};
    duplicateZeros(arr);
    System.out.println(Arrays.toString(arr));
  }
}
```

49. Write a program to given an array nums containing n distinct numbers in the range [0, n], return the only number in the range that is missing from the array.

Input nums = [3, 0, 1]

Output: 2

Explanation: n = 3 since there are 3 numbers, so all numbers are in the range [0, 3]. 2 is the missing number in the range since it does not appear in nums.

Program :-

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

class missingnum {

    public static void findMissing(int arr[], int N)
    {
        int i;
        int temp[] = new int[N + 1];
        for (i = 0; i <= N; i++) {
            temp[i] = 0;
        }

        for (i = 0; i < N; i++) {
            temp[arr[i] - 1] = 1;
        }

        int ans = 0;
        for (i = 0; i <= N; i++) {
            if (temp[i] == 0)
                ans = i + 1;
        }
        System.out.println(ans);
    }

    public static void main(String[] args)
    {
        int arr[] = { 1, 3, 7, 5, 6, 2 };
        int n = arr.length;
```

```
            findMissing(arr, n);
        }
    }
```

50. Write a program to given an integer array nums, find the subarray with the largest sum, and return its sum.

Input nums = [-2, 1,-3, 4,-1, 2, 1,-5, 4]
Output: 6
Explanation: The subarray [4,-1, 2, 1] has the largest sum 6.

Program :-

```
import java.io.*;
import java.util.*;
import java.util.Scanner;
class subarray {
public static void main(String[] args)
{
Scanner input=new Scanner(System.in);
System.out.print("Enter size of array: ");
int n=input.nextInt();
int[] a =new int[100];
System.out.println("Enter array elements: ");
for(int i=0;i<n;i++)
{
a[i]=input.nextInt();
}
System.out.println("Maximum contiguous sum is: "+ maxSubArraySum(a));
}
static int maxSubArraySum(int a[])
{
int size = a.length;
int max_so_far = Integer.MIN_VALUE, max_ending_here = 0;
for (int i = 0; i < size; i++) {
max_ending_here = max_ending_here + a[i];
if (max_so_far < max_ending_here)
max_so_far = max_ending_here;
if (max_ending_here < 0)
max_ending_here = 0;
}
return max_so_far;
}
}
```

51. Write a program to print the multiplication table of number m up to n.

Sample Input:

M = 4
N = 5

Sample Output:

1x4=4
2x4=8
3x4=12
4x4=16
5x4=20

Test cases:

M = 6, N = -3
M = -3, N = 5
M = 4, N = 0
M = 0, N = 0
M = -5, N = -5

Program :-

```
import java.util.*;
import java.util.Scanner;
class multiplicationtable {
public static void main(String[] args)
{
try
{
Scanner input=new Scanner(System.in);
System.out.print("Enter M: ");
int M=input.nextInt();
System.out.print("Enter N: ");
int N=input.nextInt();
for(int i=1;i<=N;i++)
{
System.out.println(i+"x"+M+"="+(i*M));
}
}
catch(Exception e)
{
System.out.println(" enter valid");
}
}}
```

52. Write a Java program to implement multiple threads and apply join method for thread and thread has to be started after 500ms using sleep().

Program :-

```
import java.util.*;
class multithreading
{
          public void run()
         {
           for(int i=1;i<=5;i++)
           {
             try
                {
```

```
            Thread.sleep(500);
           }
               catch(Exception e)
           {
                  System.out.println(e);
           }
          System.out.println(i);
         }
        }
        public static void main(String args[])
           {
         TestJoinMethod1 t1=new TestJoinMethod1();
         TestJoinMethod1 t2=new TestJoinMethod1();
         TestJoinMethod1 t3=new TestJoinMethod1();
          t1.start();
          try
              {
            t1.join();
          }
              catch(Exception e){
          System.out.println(e);
          }
              t2.start();
          t3.start();
        }
}
```

53. Generate a Java code that implements java selection and iteration statements. Use do while loop to process a menu selection. When a menu is selected, it should display the syntax of the selected statements.

Program :-

```
        import java.util.*;
        class menus {
          public static void main(String args[])
            throws java.io.IOException {
            char choice;

            do {
              System.out.println("Help on:");
              System.out.println("  1. if");
              System.out.println("  2. switch");
              System.out.println("  3. while");
              System.out.println("  4. do-while");
              System.out.println("  5. for\n");
              System.out.println("Choose one:");
              choice = (char) System.in.read();
            } while( choice < '1' || choice > '5');
```

```
            System.out.println("\n");

            switch(choice) {
              case '1':
                System.out.println("The if:\n");
                System.out.println("if(condition) statement;");
                System.out.println("else statement;");
                break;
              case '2':
                System.out.println("The switch:\n");
                System.out.println("switch(expression) {");
                System.out.println("  case constant:");
                System.out.println("    statement sequence");
                System.out.println("  break;");
                System.out.println("  // ...");
                System.out.println("}");
                break;
              case '3':
                System.out.println("The while:\n");
                System.out.println("while(condition) statement;");
                break;
              case '4':
                System.out.println("The do-while:\n");
                System.out.println("do {");
                System.out.println("  statement;");
                System.out.println("} while (condition);");
                break;
              case '5':
                System.out.println("The for:\n");
                System.out.print("for(init; condition; iteration)");
                System.out.println(" statement;");
                break;
            }
          }
}
```

54. Create a simple generics class with type parameters for sorting values of different types.

Program :-

```
        public class gs {
          public static < E > void printArray( E[] inputArray ) {
            for(E element : inputArray) {
              System.out.printf("%s ", element);
            }
            System.out.println();
          }
```

```
    public static void main(String args[]) {
      Integer[] intArray = { 1, 2, 3, 4, 5 };
      Double[] doubleArray = { 1.1, 2.2, 3.3, 4.4 };
      Character[] charArray = { 'H', 'E', 'L', 'L', 'O' };

      System.out.println("Array integerArray contains:");
      printArray(intArray);

      System.out.println("\nArray doubleArray contains:");
      printArray(doubleArray);
      System.out.println("\nArray characterArray contains:");
      printArray(charArray);
    }
}
```

55. Create a class name 'overload'. write a program to assign the values for two values by different number of arguments using a single function.

Program :-

```
import java.util.*;
import java.util.Scanner;
class overload {
static int add(int a,int b){return a+b;}
static int add(int a,int b,int c){return a+b+c;}
}
class overloading {
public static void main(String[] args){
System.out.println(overload.add(11,11));
System.out.println(overload.add(11,11,11));
}}
```