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CSA09 –JAVA PROGRAMMING

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

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

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

```
class stringrev
```

```
{
```

```
    public static void main(String[] args)
```

```
    {
```

```
        String a,b="";
```

```
        char c;
```

```
        int d=0;
```

```
        Scanner sc=new Scanner(System.in);
```

```
        System.out.println("Enter the string:");
```

```
        a=sc.next();
```

```
        d=a.length();
```

```
        for(i=d-1;i>=0;i--)
```

```
        {
```

```
            b=b+a.charAt(i);
```

```
        }
```

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System.out.println("The Reverse of the string is:"+ b);

}

}

2. 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

Re-enter the user name: Saveetha@123

Sample Output:

User name is Invalid

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

        String a,b;
        Scanner sc=new Scanner(System.in);
        System.out.println("Enter the username:");
        a=sc.next();
        System.out.println("Re Enter the username:");
        b=sc.next();
        if(a.equals(b))
        {
```

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```
        System.out.println("Username is valid");

    }

    else

    {

        System.out.println("Username is Invalid");

    }

}

}
```

3. 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

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

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

```
public class reverse
```

```
{
```

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

```
{
```

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```
try
{
    Scanner sc=new Scanner(System.in);
    int n,re=0,rem;
    System.out.println("Enter a number:");
    n=sc.nextInt();
    while(n!=0)
    {
        rem=n%10;
        re=re*10+rem;
        n=n/10;
    }

    System.out.println("The reversed number is:"+re);
}
catch(Exception e)
{
    System.out.println("Enter a valid number");
}
}
```

4. 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:

1. 25

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

```
import java.util.*;

import java.io.*;

public class vote
{
    public static void main(String[] args)
    {
        try
        {
            int a,b;

            Scanner sc=new Scanner(System.in);

            System.out.println("Enter your age:");

            a=sc.nextInt();

            if(a>=18)
            {
                System.out.println("You are eligible to vote");

            }

            else
            {
                b=18-a;

                System.out.println("You are allowed after"+b+"years");

            }

            if(a<0)
            {
```

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```
        System.out.println("Entry only integer value");
    }
}
catch(Exception e)
{
    System.out.println("Entry only positive integer value");
}
}
}
```

5. 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}

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

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

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```
public class GCD
{
    static int gcd(int x, int y)
    {
        int r=0, a, b;

        a = (x > y) ? x : y;
        b = (x < y) ? x : y;

        r = b;
        while(a % b != 0)
        {
            r = a % b;

            a = b;
            b = r;
        }
        return r;
    }

    static int lcm(int x, int y)
    {
        int a;

        a = (x > y) ? x : y;
        while(true)
        {
            if(a % x == 0 && a % y == 0)
                return a;

            ++a;
        }
    }
}
```

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```
public static void main(String args[])
{
    try
    {
        Scanner sc = new Scanner(System.in);
        System.out.println("Enter N value: ");
        int N=sc.nextInt();
        if(N<=0)
        {
            System.out.println("Enter only positive numbers");
        }
        if(N==2)
        {

            System.out.println("Enter the two numbers: ");
            int x = sc.nextInt();
            int y = sc.nextInt();

            System.out.println("The GCD of two numbers is: " + gcd(x, y));
            System.out.println("The LCM of two numbers is: " + lcm(x, y));
        }
        if(N==3)
        {

            System.out.println("Enter the three numbers: ");
```


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```
int x = sc.nextInt();
int y = sc.nextInt();
int z = sc.nextInt();
int i;
int a=Math.max(x,Math.max(y,z));
while(true)
{
    if(a % x == 0 && a % y == 0 && a%z==0)
    {
        break;
    }
    else
        ++a;
}

System.out.println("LCM of "+x+", "+y+" and "+z+" is "+a);
int b=Math.min(x,Math.min(y,z));
for(i=b;i>=0;i--)
{
    if((x%i==0) && (y%i==0) && (z%i==0))
        break;
}

System.out.println("GCD of "+x+", "+y+" and "+z+" is "+i);

}
```

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```
catch(Exception e)
{
    System.out.println("Enter only numbers");

}
}
}
```

6. Write a program to print Right Triangle Star Pattern

Sample Input:: n = 5

Output:

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

```
import java.io.*;
import java.util.*;
class rightpat
{
    public static void main(String[] args)
    {
        int i, j, n;
        Scanner sc=new Scanner(System.in);
        System.out.print("Enter the number.of.rows:");
        n=sc.nextInt();
```

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```
for (i=0; i<n; i++)
{
    for (j=2*(n-i); j>=0; j--)
    {
        System.out.print(" ");
    }
    for (j=0; j<=i; j++ )
    {
        System.out.print("* ");
    }
    System.out.println();
}
}
```

7. Write a program to print the below pattern?

```
import java.util.Scanner;
class pascal
{
    public static void main(String[] args)
    {
        int num;
        Scanner s = new Scanner(System.in);

        System.out.print("Enter the Row Size of Pascal Triangle: ");
        int row = s.nextInt();

        for(int i=0; i<row; i++)
        {
            for(int space=row; space>i; space--)
                System.out.print(" ");
            num=1;
            for(int j=0; j<=i; j++)
            {
                System.out.print(num+ " ");
                num = num*(i-j)/(j+1);
            }
        }
    }
}
```

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

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

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.

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

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

```
class pnr
```

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

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```
double p;
int n;
double r,i;
Scanner sc=new Scanner(System.in);
System.out.println("Enter the principal amount:");
p=sc.nextDouble();
System.out.println("Enter the no.of.years:");
n=sc.nextInt();
System.out.print("Is the person is senior citizen(y/n): ");
char g=sc.next().charAt(0);

if(g=='y'||g=='Y')
{
    r=12;
    i=p*n*r/100;
    System.out.println("Interest:"+i);

}
if(g=='n'||g=='N')
{
    r=10;
    i=p*n*r/100;
    System.out.println("Interest:"+i);
}
if(p<=0)
{

    System.out.println("Enter the valid amount");
}
if(n<=0)
{

    System.out.println("Enter the valid no.of.years");
}
}
catch(Exception e)
{
```

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```
        System.out.println("Enter the amount");
    }
}
}
```

9. 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)

```
import java.util.Scanner;
import java.io.*;
class even
{
    public static void main(String[] args){
        int N, 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: ");
        N = my_scanner.nextInt();
        int fabonacci[] = new int[2 * N + 1];
        fabonacci[0] = 0;
        fabonacci[1] = 1;
        sum = 0;
        for (i = 2; i <= 2 * N; 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" ,
            N, sum);
    }
}
```

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10. 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

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

class skip
{
    public static void main(String args[])
    {
        int m,n,k;

        Scanner sc = new Scanner(System.in);

        System.out.println("Enter the value for M");
        m = sc.nextInt();

        System.out.println("Enter the value for N");
        n = sc.nextInt();

        System.out.println("Enter the value for k");
        k= sc.nextInt();

        if(m > n)
```

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```
System.out.println("N should be greater");
else if( (m < n) && (k < 0))
System.out.println("when m < n, K should not negative");
else if( (m==0 && n ==0) || m == n)
System.out.println("Invalid inputs for m and n due to they are equal");
else
{
for(int i=m;i<=n;i=i+(k+1))
{
System.out.println(i);
}
}
}
}
```

11. 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

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

```
class matrix
```

```
{
```


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```
public static void main(String args[])
{
    int row, col,i,j;
    Scanner in = new Scanner(System.in);

    System.out.println("Enter the number of rows");
    row = in.nextInt();

    System.out.println("Enter the number columns");
    col = in.nextInt();

    int mat1[][] = new int[row][col];
    int mat2[][] = new int[row][col];
    int res[][] = new int[row][col];

    System.out.println("Enter the elements of matrix1");

    for ( i= 0 ; i < row ; i++ )
    {

        for ( j= 0 ; j < col ;j++ )
            mat1[i][j] = in.nextInt();

        System.out.println();
    }
```

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```
System.out.println("Enter the elements of matrix2");
```

```
for ( i= 0 ; i < row ; i++ )
```

```
{
```

```
for ( j= 0 ; j < col ;j++ )
```

```
mat2[i][j] = in.nextInt();
```

```
System.out.println();
```

```
}
```

```
for ( i= 0 ; i < row ; i++ )
```

```
for ( j= 0 ; j < col ;j++ )
```

```
res[i][j] = mat1[i][j] + mat2[i][j] ;
```

```
System.out.println("Sum of matrices:-");
```

```
for ( i= 0 ; i < row ; i++ )
```

```
{
```

```
for ( j= 0 ; j < col ;j++ )
```

```
System.out.print(res[i][j]+"\\t");
```

```
System.out.println();
```

```
}
```

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```
}  
  
}
```

- 12. Write a program to print rectangle symbol pattern.**
Get the symbol as input from user

```
import java.io.*;  
import java.util.*;  
class rectpat  
{  
    public static void main(String[] args)  
    {  
        int i,j,m,n;  
        char c;  
        Scanner sc=new Scanner(System.in);  
        System.out.print("Enter the number.of.rows:");  
        m=sc.nextInt();  
        System.out.print("Enter the number.of.columns:");  
        n=sc.nextInt();  
        System.out.print("Enter the symbol:");  
        c=sc.next().charAt(0);  
  
        for (i=0; i<m; i++)  
        {  
            for (j=0; j<n; j++)  
            {  
                System.out.print(c);  
            }  
        }
```

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```
System.out.println();  
}  
}  
}
```

- 13.** 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

```
import java.util.Scanner;  
class sort  
{  
    public static void main(String[] args)  
    {  
        Scanner sc=new Scanner(System.in);  
        int n;  
        System.out.print("Enter the no. strings you want to Enter: ");  
        n= sc.nextInt();  
        String[] s1=new String[n];  
        String temp;  
        System.out.println("Enter the strings: ");  
        for(int i=0;i<n;i++)  
            s1[i]=sc.next();  
        System.out.print("Enter the order D/A: ");  
        char ch=sc.next().charAt(0);  
        if(ch=='D'){  
            for(int i=0;i<n-1;i++)  
                for(int j=i+1;j<n;j++)  
                    if(s1[i].compareTo(s1[j])<0)  
                    {  
                        temp=s1[i];
```

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```
s1[i]=s1[j];
s1[j]=temp;
}
}
if(ch=='A')
{
for(int i=0;i<n-1;i++)
for(int j=i+1;j<n;j++)
if(s1[i].compareTo(s1[j])>0)
{
temp=s1[i];
s1[i]=s1[j];
s1[j]=temp;
}
}
for(int i=0;i<n;i++)
System.out.print(s1[i]+" "+"\\n");
}
}
```

14. 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

```
import java.util.Scanner;
class matrixmul
{
public static void main(String args[]){
int row1, col1, row2, col2;
Scanner s = new Scanner(System.in);
System.out.print("Enter number of rows in first matrix:");
row1 = s.nextInt();
System.out.print("Enter number of columns in first matrix:");
col1 = s.nextInt();
System.out.print("Enter number of rows in second matrix:");
row2 = s.nextInt();
System.out.print("Enter number of columns in second matrix:");
col2 = s.nextInt();
```

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```
if (col1 != row2) {
    System.out.println("Matrix multiplication is not possible");
}
else {
    int a[][] = new int[row1][col1];
    int b[][] = new int[row2][col2];
    int c[][] = new int[row1][col2];
    System.out.println("Enter values for matrix A : \n");
    for (int i = 0; i < row1; i++) {
        for (int j = 0; j < col1; j++)
            a[i][j] = s.nextInt();
    }
    System.out.println("Enter values for matrix B : \n");
    for (int i = 0; i < row2; i++) {
        for (int j = 0; j < col2; j++)
            b[i][j] = s.nextInt();
    }
    System.out.println("Matrix multiplication is : \n");
    for(int i = 0; i < row1; i++) {
        for(int j = 0; j < col2; j++){
            c[i][j]=0;
            for(int k = 0; k < col1; k++){
                c[i][j] += a[i][k] * b[k][j];
            }
            System.out.print(c[i][j] + " ");
        }
        System.out.println();
    }
}
```

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15. 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

```
import java.util.*;
class pat11111
{
    public static void main(String[] args)
    {
        int i, j;
        char ch;

        Scanner s= new Scanner(System.in);
        System.out.print(" Enter the character : ");
        ch = s.next().charAt(0);
        System.out.println("Enter the no.of.rows:");
        int row = s.nextInt();

        for(i=0; i<row; i++)
        {
            for(j=i; j>=0; j--)
                System.out.print(ch+" ");
            System.out.print("\n");
        }
    }
}
```

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```
for(i=0; i<(row-1); i++)  
{  
for(j=(row-1); j>i; j--)  
System.out.print(ch+" ");  
System.out.print("\n");  
}  
}  
}
```

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

```
import java.util.Scanner;  
class special  
{  
public static void main(String[] args) {  
Scanner sc=new Scanner(System.in);  
String s1;  
int len, sp_count=0,alp_count=0,n_count=0;  
System.out.print("Enter the text: ");  
s1=sc.nextLine();  
len=s1.length();  
char[] ch=s1.toCharArray();  
for(int i=0;i<len;i++){  
if(Character.isDigit(ch[i]))  
n_count++;  
else if((ch[i]>='a' && ch[i]<='z') || (ch[i]>='A' && ch[i]<='Z')){  
alp_count++;  
}  
else  
{  
System.out.print(ch[i]);  
sp_count++;  
}  
}  
  
System.out.println();  
System.out.println("total special character: "+sp_count);
```


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```
}  
}
```

17. 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

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

```
class compositebw
```

```
{
```

```
static Scanner input = new Scanner(System.in);
```

```
public static void main(String[] args)
```

```
{
```

```
try
```

```
{
```

```
System.out.print("enter the starting number:");
```

```
int start = input.nextInt()+1;
```

```
System.out.print("enter the ending number:");
```

```
int end = input.nextInt();
```

```
if(start<=0 || end<=0)
```

```
System.out.print("Enter the value correctly");
```

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```
if(start>end)
System.out.print("Enter the value correctly");
while(start<=end)
{
int count = 0;
int j = 2;
while(j<start){
if(start%j==0)
count++;
j++;
}

if(count>0)
System.out.println(start);
start++;
}
}
catch(Exception e)
{
System.out.println("Enter only numbers");
}
}
}
```

- 18. Write a program to print the Inverted Full Pyramid pattern?**
import java.util.Scanner;

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```
class invertedpy
{
private static Scanner sc;
public static void main(String[] args)
{
sc = new Scanner(System.in);
System.out.print("Enter Inverted Pyramid Pattern Rows = ");
int rows = sc.nextInt();
System.out.print("Character for Inverted Pyramid Pattern = ");
char ch = sc.next().charAt(0);
InvertedPyramidPattern(rows, ch);
}
public static void InvertedPyramidPattern(int rows, char ch)
{
for (int i = rows ; i >= 1; i-- )
{
for (int j = 0 ; j < rows - i; j++ )
{
System.out.print(" ");
}
for (int k = 0 ; k != (2 * i) - 1; k++ )
{
System.out.print(ch);
}
System.out.println();
}
}
}
```

19. 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}

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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}

```
import java.util.Scanner;
class arr
{
    public static void main(String[] args)
    {
        Scanner s=new Scanner(System.in);
        System.out.print("Enter the array size: ");
        int size=s.nextInt();
        float[] arr=new float[size];
        float msum=0;
        System.out.print("Enter the array elements: ");
        for(int i=0;i<size;i++){
            arr[i]=s.nextFloat();
            msum+=arr[i];
        }
        float temp=0;
        for(int i=0;i<size;i++){

            for(int j=0;j<size;j++){
                if(arr[i]<arr[j]){
                    temp=arr[i];
                    arr[i]=arr[j];
                    arr[j]=temp;
                }
            }
        }
        System.out.println("Mean: "+(int)(msum/size));
        if(size%2==0)
            System.out.println("Median: "+(int)((arr[size/2]+arr[(size/2)+1])/2));
        else
            System.out.println("Median: "+(int)(arr[size/2]));
    }
}
```

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```
float max=0;
int o_count=0,n_count=0;

for(int i=0;i<size;i++){
for(int j=0;j<size;j++){
if(arr[i]==arr[j])
n_count++;
}
if(o_count<n_count){
max=arr[i];
o_count=n_count;
}
n_count=0;
}
System.out.print("Mode: "+(int)max);
}
}
```

20. 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

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

```
class factorial
```

```
{
```

```
public static void main(String[] args)
```

```
{
```

```
try
```

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```
{
int n,fact=1,i;
Scanner s= new Scanner(System.in);
System.out.print(" Enter the number : ");
n= s.nextInt();
if(n<=0)
{
    System.out.print("Enter only positive numbers");
}
else
{
    for(i=1;i<=n;i++)
    {
        fact=fact*i;
    }
    System.out.print("The factorial of "+n+" is "+fact);
}

}

catch(Exception e)
{
    System.out.print("Enter only numbers");
}
```

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```
}  
}
```

21. Write a program to print the following pattern

Sample Input:

Enter the Character to be printed: %

Max Number of time printed: 3

%

% %

% % %

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

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

```
class rectpat
```

```
{
```

```
    public static void main(String[] args)
```

```
    {
```

```
        int i,j,m;
```

```
        char c;
```

```
        Scanner sc=new Scanner(System.in);
```

```
        System.out.print("Enter the number.of.rows:");
```

```
        m=sc.nextInt();
```

```
        System.out.print("Enter the symbol:");
```

```
        c=sc.next().charAt(0);
```

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```
        for (i=0; i<m; i++)
        {
            for (j=0; j<i; j++)
            {
                System.out.print(c+" ");
            }

            System.out.println();
        }
    }
}
```

22. 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

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

```
class leap {
    public static void main(String[] args){
        try{
            int date;
```


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```
System.out.println("Enter date :: ");
Scanner sc = new Scanner(System.in);
date = sc.nextInt();
int month;
System.out.println("Enter month :: ");
Scanner sc1 = new Scanner(System.in);
month = sc.nextInt();
int year;
System.out.println("Enter an Year :: ");
year = sc.nextInt();
Scanner sc2 = new Scanner(System.in);
System.out.println("The entered date is:"+date+"/"+month+"/"+year);

if((date<=31)&& (date>0) && (month<=12)){

    if (((year % 4 == 0) && (year % 100!= 0)) || (year%400 == 0))
        System.out.println("Specified year is a leap year");
    else
        System.out.println("Specified year is not a leap year");
}
else{
    System.out.println("enter valid data");
}
}
catch(Exception e){
```

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```
System.out.println("enter valid data");  
}  
}  
}
```

23. 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

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

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

```
class factor
```

```
{
```

```
    public static void main(String args[])
```

```
    {
```

```
        try
```

```
        {
```

```
            Scanner sc=new Scanner(System.in);
```

```
            int count=0,n,i,j=0,m;
```

```
            int []a;
```

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```
System.out.println("Enter the number:");
n=sc.nextInt();
m=sc.nextInt();
if(n<=0)
{
    System.out.println("Enter valid number");
}
else
{
    for(i=1;i<=n;i++)
    {
        if(n%i==0)
        {
            count++;
        }
    }
    System.out.println("The number of factors:"+count);
}
}
catch(Exception e)
{
    System.out.println("Enter only numbers");
}
}
```

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24. 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

```
import java.util.Scanner;
public class perfectn
{
    public static void main(String args[])
    {
        try
        {
            long n, sum=0;
            Scanner sc=new Scanner(System.in);
            System.out.print("Enter the number: ");
            n=sc.nextLong();
            int i=1;
            if(n<=0)
            {
                System.out.println("Enter the valid number ");
            }

            else
            {
                while(i <= n/2)
                {
                    if(n % i == 0)
                    {
                        sum = sum + i;
                    }
                    i++;
                }
            }
        }
    }
}
```

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```
}

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.print("Enter the valid number");
}
}
}
```

25. 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

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

```
class vowel
```

```
{
```

```
    public static void main(String[] args)
```

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```
{
Scanner in = new Scanner(System.in);
int count=0;
System.out.print("Input the string: ");
String str = in.nextLine();
for (int i = 0; i < str.length(); i++)
{
if (str.charAt(i) == 'a' || str.charAt(i) == 'e' || str.charAt(i) == 'i'
|| str.charAt(i) == 'o' || str.charAt(i) == 'u' || str.charAt(i) ==
'A' || str.charAt(i) == 'E' || str.charAt(i) == 'I' || str.charAt(i) ==
'O' || str.charAt(i) == 'U')
{
count++;
}
}
System.out.print("Number of Vowels in the string: " + count);
}
}
```

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

Get the symbol from user.

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

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```
Scanner sc = new Scanner(System.in);
System.out.println("Enter the no.of.rows:");
int row = sc.nextInt();
System.out.println("Enter the no.of.coloumns:");
int col = sc.nextInt();
if(row<=0||col<=0)
{
    System.out.println("Enter only positive numbers");
}
if(row<=0&&col<=0)
{
    System.out.println("Enter only positive numbers");
}
else
{
    for (int i = 1; i <=row; i++)
    {
        for (int j = 1; j <=col; j++)
        {
            if((i==1 || i==row) || (j==1 || j==col))
            {
                System.out.print("$");
            }
            else
            {
                System.out.print(" ");
            }
        }
    }
    System.out.println();
}
}
}
}
catch(Exception e)
{
    System.out.println("Invalid due to character exception");
}
}
```

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}

26. 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

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

```
class convow
```

```
{
```

```
    public static void main(String[] args)
```

```
{
```

```
    Scanner sc= new Scanner(System.in);
```

```
    System.out.print("Enter a string: ");
```

```
    String line= sc.nextLine();
```

```
    int vowels = 0, consonants = 0, digits = 0, spaces = 0;
```

```
    line = line.toLowerCase();
```

```
    System.out.print("Vowels: ");
```

```
    for (int i = 0; i < line.length(); ++i)
```

```
{
```

```
    char ch = line.charAt(i);
```

```
    if (ch == 'a' || ch == 'e' || ch == 'i' || ch == 'o' || ch == 'u')
```


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```
{
++vowels;
System.out.print(ch);
}
}

System.out.print("\n");
System.out.print("Consonants: ");
for (int i = 0; i < line.length(); ++i)
{
char ch = line.charAt(i);
if (ch >= 'a' && ch <=
'z' && ch != 'a' && ch != 'e' && ch != 'i' && ch != 'o' && ch != 'u')
{
++consonants;
System.out.print(ch);
}
}
}
```

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27. Write a program to print the Fibonacci series.

Sample Input:

Enter the n value: 6

Sample Output:

0 1 1 2 3 5

```
import java.util.Scanner;
class fibo
{
    public static void main(String[] args)
    {
        try
        {
            int N,n1=0,n2=1,i,sum=0;
            Scanner s= new Scanner(System.in);
            System.out.print(" Enter the number : ");
            N= s.nextInt();
            if(N<=0)
            {
                System.out.print("Enter only positive numbers");
            }

            else
            {
                System.out.println("The fibonacci series:");
                System.out.print(n1+"\t");
                System.out.print(n2+"\t");
                for(i=2;i<N;i++)
                {

                    sum=n1+n2;
                    System.out.print(sum+"\t");
                    n1=n2;
                    n2=sum;
                }
            }
        }
    }
}
```

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```
    }  
    catch(Exception e)  
    {  
        System.out.print("Enter only numbers");  
    }  
}  
}
```

Test Condition: Implement negative Fibonacci series

Write a program to print the below pattern

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

```
import java.util.*;  
class pat  
{  
    public static void main(String[] args)  
    {  
        try  
        {  
            Scanner sc= new Scanner(System.in);  
            System.out.print("Enter a number: ");  
            int c= sc.nextInt();  
            if(c<=0)  
            {
```

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```
        System.out.println("Enter only positive numbers");
    }
    else
    {
        for (int i = 0; i <= c; ++i)
        {
            for(int j=1;j<=i;j++)
            {
                System.out.print(i);

            }

            System.out.println();

        }
    }
    catch(Exception e)
    {
        System.out.println("Due to character exception");
    }
}
```

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28. 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

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

```
public class sqcu
```

```
{
```

```
    public static void main(String args[])
```

```
{
```

```
    try
```

```
{
```

```
        Scanner sc = new Scanner(System.in);
```

```
        double num,cube;
```

```
        System.out.print("Enter the number: ");
```

```
        num = sc.nextDouble();
```

```
        System.out.println("Square of " + num + " is: " + Math.pow(num, 2));
```

```
        cube=num*num*num;
```

```
        System.out.println("Cube of "+num+" is: "+cube);
```

```
    }
```

```
    catch(Exception e)
```

```
{
```

```
        System.out.println("Enter valid number");
```

```
}
```

```
}
```

```
}
```

29. Program to find the frequency of each element in the array.

Sample Input & Output:

{1, 2, 8, 3, 2, 2, 2, 5, 1}

Element Frequency	

1	2
2	4

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```
8      |      1
3      |      1
5      |      1
import java.util.*;
public class freq
{
    public static void main(String[] args)
    {
        try
        {
            Scanner s=new Scanner(System.in);
            int [] arr;
            int n,k;
            System.out.print("Enter the no. of element: ");
            n= s.nextInt();
            arr = new int[n];
            System.out.print("Enter elements: ");
            for(k=0;k<n;k++)
            {
                arr[k]=s.nextInt();
            }
            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++;
            fr[j] = visited;
            }
            }
            if(fr[i] != visited)
            fr[i] = count;
            }

            System.out.println("-----");
            System.out.println(" Element | Frequency");
            System.out.println("-----");
```

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```
for(int i = 0; i < fr.length; i++){  
    if(fr[i] != visited)  
        System.out.println(" " + arr[i] + " | " + fr[i]);  
    }  
    System.out.println("-----");  
    }  
catch(Exception e)  
{  
    System.out.println("Due to string Exception");  
}  
}  
}
```

30. 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

31. Find the factorial of n?

Sample Input:

N = 6

Sample Output:

6 Factorial = 720

Test cases:

1. N = 0
2. N = -5
3. N = 1
4. N = Q
5. N = 3A

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32. Write a program to print the below pattern

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

```
import java.io.*;
import java.util.*;
class sqpat
{
    public static void main(String args[])
    {
        int n,i,j,c;
        Scanner sc=new Scanner(System.in);
        System.out.println("Enter the no.of.rows");
        n=sc.nextInt();
        c=1;
        for(i=0;i<n;i++)
        {
            for(j=1;j<=i;j++)
            {
                System.out.print(c*c+" ");
                c++;
            }

            System.out.println();
        }
    }
}
```

33. 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}

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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}

```
import java.util.Scanner;
public class composite
{
    public static void main(String[] args)
    {
        try
        {
            int p_count = 0, c_count = 0;
            float[] arr;
            int size;
            Scanner s = new Scanner(System.in);
            System.out.print("Enter the no. of element: ");
            size = s.nextInt();
            arr = new float[size];
            System.out.println("Enter the elements: ");
            for (int i = 0; i < size; i++)
                arr[i] = s.nextFloat();
            for (int j = 0; j < size; j++) {
                int count = 0;
                if (arr[j] > 0) {
                    for (int k = 1; k <= arr[j]; k++) {
                        if (arr[j] % k == 0)
```

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```
count++;
}
if (count > 2)
c_count++;
else
p_count++;
}
else if(arr[j]<0) {
for (float k =arr[j]; k<=-1; k++) {
if (arr[j] % k == 0)
count++;
}
if (count > 2){
c_count++;
}
else{
p_count++;
}
}
}
System.out.println("No. of composite num: " + c_count);
System.out.println("No. of Prime num: " + p_count);
s.close();
}
catch(Exception e)
{
    System.out.println("Enter only positive numbers");
}
}
}
```

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34. Find the n^{th} odd number after n odd number

Sample Input:

N : 4

Sample Output:

4th Odd number after 4 odd numbers = 15

Test cases:

1. N = 0

2. N = -6

3. N = 2021

4. N = -14.5

5. N = -196

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

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

```
class odd
```

```
{
```

```
public static void main(String args[])
```

```
{
```

```
try
```

```
{
```

```
Scanner sc=new Scanner(System.in);
```

```
int n,n1;
```

```
System.out.println("Enter the number:");
```

```
n=sc.nextInt();
```

```
int x=n*2;
```

```
n1=2*x-1;
```

```
System.out.println(n+" th odd number after " + n + "is:"+n1);
```

```
}
```

```
catch(Exception e)
```

```
{
```

```
System.out.println("Due to character exception");
```

```
}
```

```
}
```

```
}
```

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35. 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.

```
import java.util.*;
import java.io.*;
public class charsearch
{
    public static void main(String[] args)
    {
        Scanner sc=new Scanner(System.in);
        char c;
        String s;
        System.out.println("Enter the string:");
        s=sc.next();
        System.out.println("Enter the character to be searched:");
        c=sc.next().charAt(0);
        for(int i=0;i<s.length();i++)
        {
            if(s.charAt(i)==c)
                System.out.println("position:"+i);
        }
    }
}
```

36. Write a program to print the below pattern

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

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3 3 3

2 2

1

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

```
class revp
```

```
{
```

```
    public static void main(String[] args)
```

```
    {
```

```
        Scanner sc = new Scanner(System.in);
```

```
        System.out.println("Enter the number of rows:");
```

```
        int rows = sc.nextInt();
```

```
        for (int i = 1; i <= rows; i++)
```

```
        {
```

```
            for (int j = 1; j <= i; j++)
```

```
            {
```

```
                System.out.print(i+" ");
```

```
            }
```

```
            System.out.println();
```

```
        }
```

```
        for (int i = rows-1; i >= 1; i--)
```

```
        {
```

```
            for (int j = 1; j <= i; j++)
```

```
            {
```

```
                System.out.print(i+" ");
```

```
            }
```

```
            System.out.println();
```

```
        }
```

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```
}  
}
```

37. 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

```
import java.io.*;  
import java.util.*;  
class arms  
{  
    public static void main(String args[])  
    {  
        try  
        {  
            Scanner sc=new Scanner(System.in);  
            int n,rem1,rem,result=0,n1,c=0,n2;  
            System.out.println("Enter the number:");  
            n=sc.nextInt();  
            n1=n;  
            n2=n;  
            while(n1!=0)  
            {  
                rem=n1%10;  
                c++;  
                n1=n1/10;  
            }  
            while(n2!=0)  
            {  
                rem=n2%10;
```

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```
        result+=Math.pow(rem,c);
        n2=n2/ 10;
    }
    if(result == n)
        System.out.println(n+ " is an Armstrong number.");
    else
        System.out.println(n+ " is not an Armstrong number.");
    }
    catch(Exception e)
    {
        System.out.println("Due to character exception");
    }
}
}
```

- 38.** 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
4. SATISFACTION
5. DEDICATION

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

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

```
import java.util.Arrays;
```

```
class strde {
```

```
    public static void main(String[] args) throws Exception
```

```
{
```

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```
String str;  
  
Scanner sc=new Scanner(System.in);  
  
System.out.println("Enter the string:");  
  
str=sc.next();
```

```
char arr[] = str.toCharArray();
```

```
char temp;
```

```
int i = 0;  
while (i < arr.length) {  
    int j = i + 1;  
    while (j < arr.length) {  
        if (arr[j] > arr[i]) {  
  
            temp = arr[i];  
            arr[i] = arr[j];  
            arr[j] = temp;  
        }  
        j += 1;  
    }  
}
```


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```
        }  
        i += 1;  
    }
```

```
        System.out.println("Alphabetical order:");  
        System.out.println(arr);  
    }  
}
```

- 39.** 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

```
import java.util.Scanner;  
class vowelre  
{  
    public static void main(String args[])  
    {  
        String str1, str2;  
        Scanner scan = new Scanner(System.in);  
        System.out.print("Enter a String : ");  
        str1 = scan.nextLine();  
        str2 = str1.replaceAll("[aeiouAEIOU]", "");  
        System.out.print("\nNew String is : ");  
        System.out.print(str2);  
    }  
}
```

- 40.** Write a program to print hollow SquareDollar pattern?

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41. 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 number: 143

Sample Output:

Sum of 3 digit number: 8

Test cases:

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

```
import java.util.Scanner;
class sumdi
{
public static void main(String arg[])
{
try
{
int m, n,sum,n1,c=0;
Scanner sc=new Scanner(System.in);
System.out.println("Enter the no.of.digits: ");
m=sc.nextInt();
System.out.println("Enter a number ");
n=sc.nextInt();
int n2=n;
while(n2>0)
{
n1=n%10;
c++;
n2=n2/10;

}
System.out.println("Digits:"+c);
if(m==c)
{
```

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```
for(sum=0 ;n!=0 ;n/=10)
{
    sum+=n%10;
}
System.out.println("Sum of digits "+sum);
}
else
{
    System.out.println("Enter the correct digit number");
}
}
catch(Exception e)
{
    System.out.println("Due to character exception");
}
}
}
```

42. 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

```
import java.util.Scanner;
class rootsq
{
    public static void main(String[] args)
    {
        System.out.print("Enter a number: ");
```

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```
Scanner sc = new Scanner(System.in);

int n = sc.nextInt();
if(n<=0)
{
    if(n==0)
    {
        System.out.println("Zero doesn't have any square root value");
    }
    else
    {
        System.out.println("Due to negative value ");
    }
}

else
{
    double x = Math.sqrt(n);
    if(x == (int)x)
    {
        System.out.print("square root of perfect square:" +x);
        System.out.print(", -" +x);
    }
    else
    {
        System.out.println("please enter perfect square number");
    }
}
}}
```

43. Write a program for matrix multiplication?

Sample Input:

Mat1 = 1 2

5 3

Mat2 = 2 3

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4 1

Sample Output:

Mat Sum = 10 5

22 18

44. Write a program to print inverted pyramid pattern.