1) 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

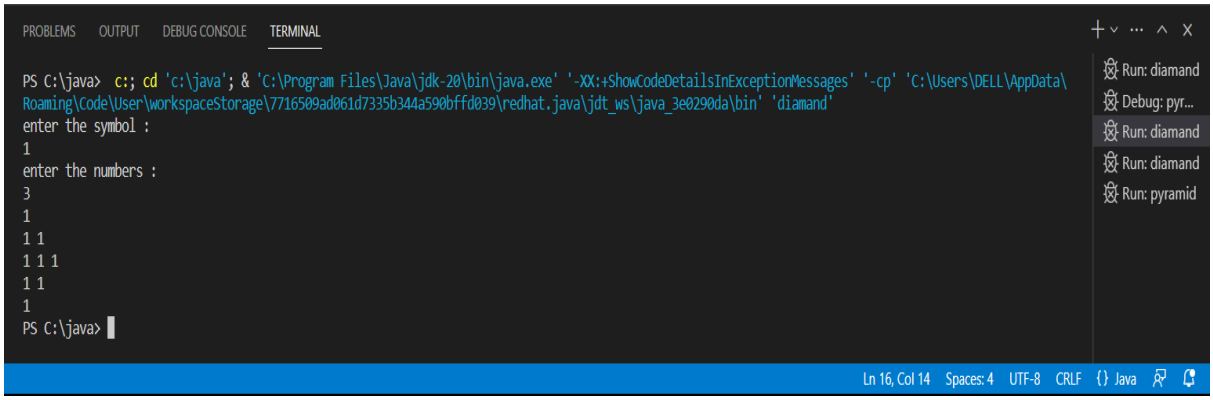
1

PROGRAM :-

```
import java.util.*;
public class diamand {
    public static void main(String[] args) {
        int i,j,n;
        String h;
        Scanner v = new Scanner(System.in);
        System.out.println("enter the symbol : ");
        h = v.nextLine();
        System.out.println("enter the numbers :");
        n = v.nextInt();
        for(i=1;i<=n;i++)
        {
            for(j=1;j<=i;j++)
            {
                System.out.print(h+" ");
            }
            System.out.println();
        }
        for(i=n-1;i>=1;i--)
        {
            for(j=1;j<=i;j++)
            {
                System.out.print(h+" ");
            }
            System.out.println();
        }

    }
}
```

OUT PUT :-



2) Write a program to print the following pattern

Sample Input:

Enter the Character to be printed: %

Max Number of time printed: 3

%

% %

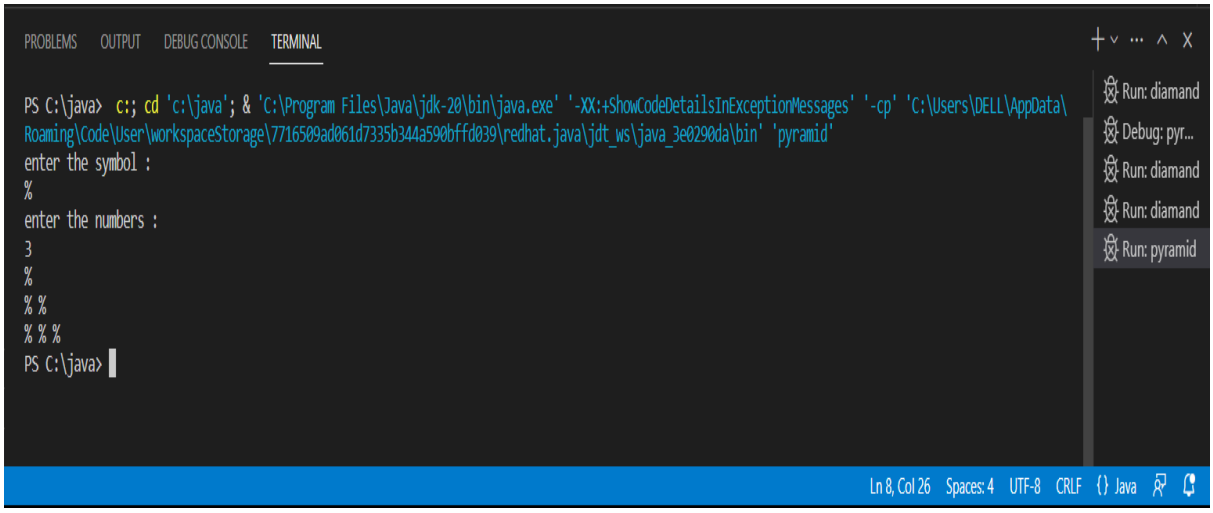
% % %

PROGRAM :-

```java
import java.util.*;
public class pyramid {
    public static void main(String[] args) {
        int i,j,n;
        String h;
        Scanner v = new Scanner(System.in);
        System.out.println("enter the symbol : ");
        h = v.nextLine();
        System.out.println("enter the numbers :");
        n = v.nextInt();
        for(i=0;i<n;i++)
        {
            for(j=0;j<=i;j++)
            {
                System.out.print(h+" ");
            }
            System.out.println();
        }

    }
}
```

OUT PUT :-



3) Write a program to print Right Triangle Star Pattern

Sample Input:: n = 5

Output:

*

* *

* * *

* * * *

* * * * *

PROGRAM :-

```
import java.util.*;
public class rightangle {
    public static void main(String[] args) {
        int i,j,n;
        Scanner v = new Scanner(System.in);
        System.out.println("enter the numbers :");
        n = v.nextInt();
        for(i=0;i<n;i++)
```

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

    }
}
```

OUTPUT :-

4) Write a program to print the below pattern?

1

1 1

1 2 1

1 3 3 1

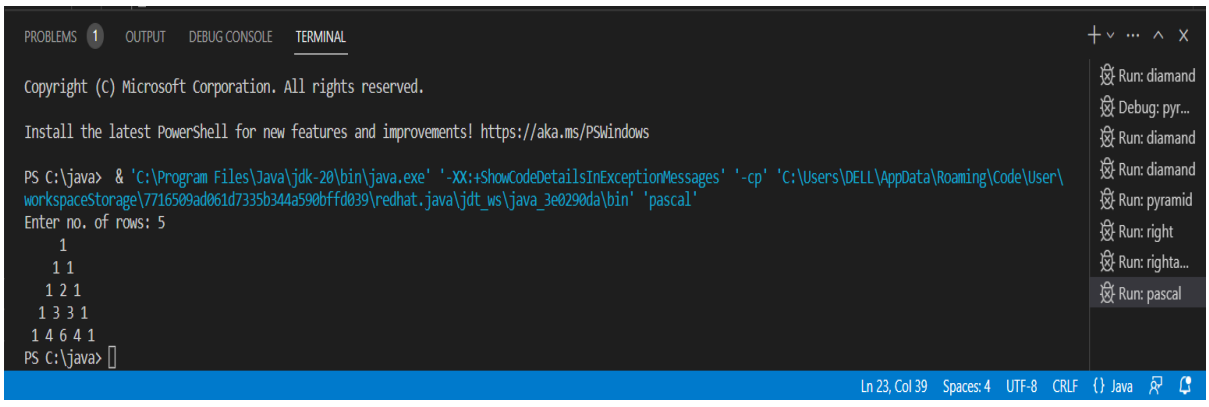
1 4 6 4 1

PROGRAM :-

```
import java.util.*;
public class pascal {
   public static void main(String[] args)
   {
      int row, i, j, space, num;
      Scanner sc=new Scanner(System.in);
```

```
      System.out.print("Enter no. of rows: ");
    if(!sc.hasNextInt())
    {
        System.out.println("Invalid Enter only integers");
        return;
    }
      row=sc.nextInt();
      for(i=0; i<row; i++)
      {
         for(space=row; space>i; space--)
         {
            System.out.print(" ");
         }
         num=1;
         for(j=0; j<=i; j++)
         {
            System.out.print(num+" ");
            num = num*(i-j)/(j+1);
         }
         System.out.println();
      }
   }
}
```

OUTPUT :-



5) Write a program to print the below pattern

1

2 2

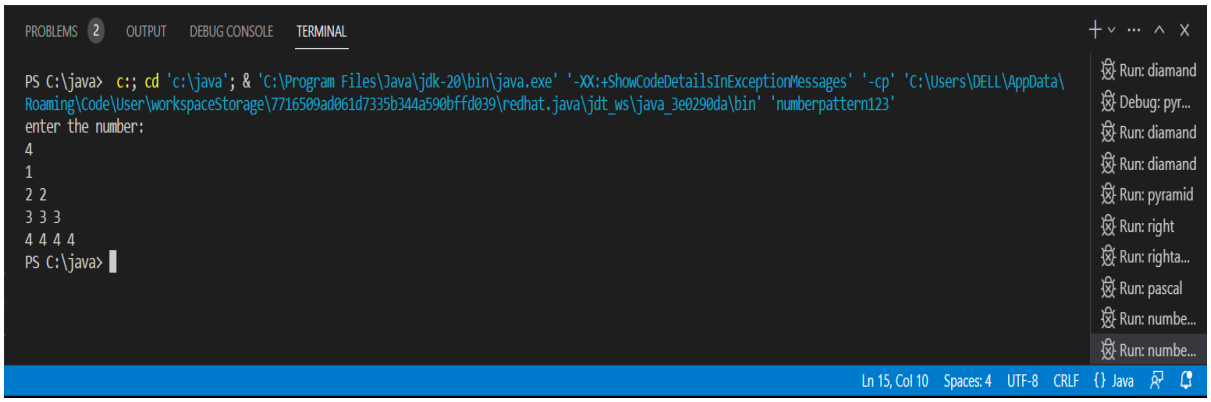
3 3 3

4 4 4 4

PROGRAM :-

```java
import java.util.*;
public class numberpattern123 {
    public static void main(String[] args) {
        int i,j,n;
        Scanner v = new Scanner(System.in);
        System.out.println("enter the number: ");
        n = v.nextInt();
        for (i=1;i<=n;i++)
        {
            for (j=0;j<i;j++)
            {
                System.out.print(i+ " ");
            }
            System.out.println();
        }
    }
}
```

OUTPUT :-



6) Write a program to print the below pattern

1

2 2

3 3 3

4 4 4 4

3 3 3

2 2

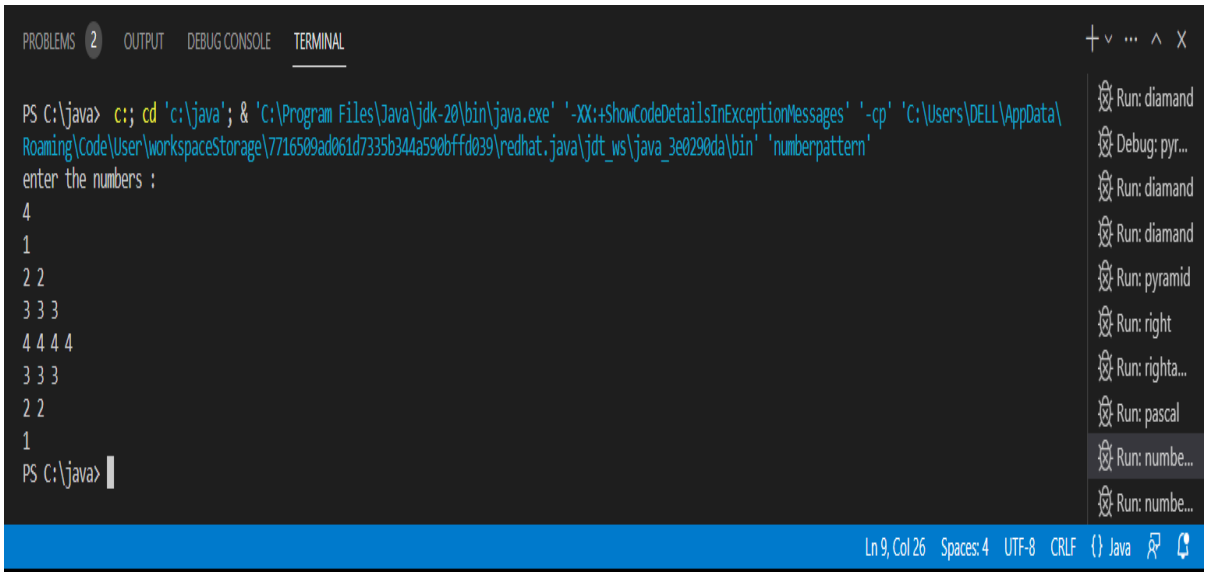
1

PROGRAM :-

```java
import java.util.*;
public class numberpattern {
    public static void main(String[] args) {
        int i,j,n;
        String h;
        Scanner v = new Scanner(System.in);
        System.out.println("enter the numbers :");
        n = v.nextInt();
        for(i=1;i<=n;i++)
        {
            for(j=1;j<=i;j++)
            {
                System.out.print(i+" ");
            }
            System.out.println();
        }
        for(i=n-1;i>=1;i--)
        {
            for(j=1;j<=i;j++)
            {
                System.out.print(i+" ");
            }
            System.out.println();
        }

    }
}
```

OUT PUT :-

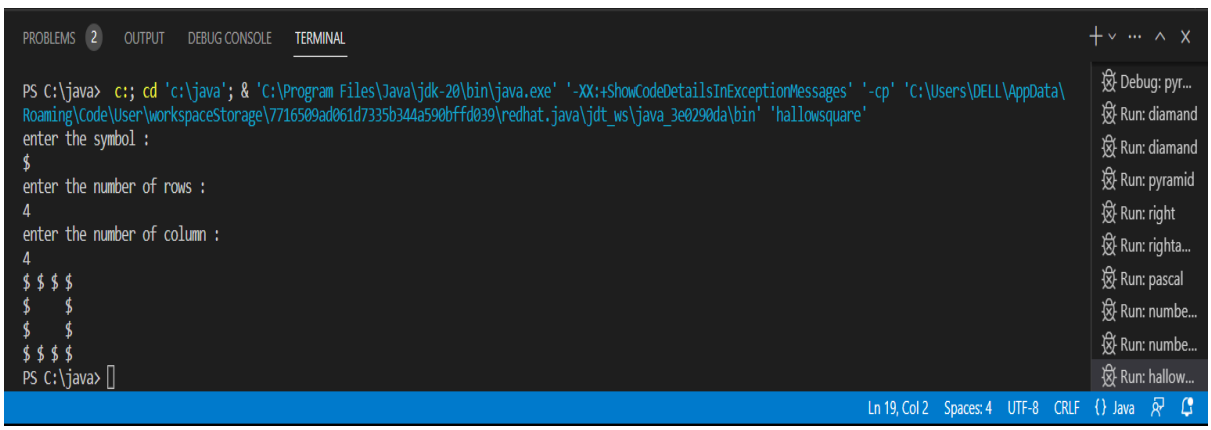


7) Write a program to print hollow Square Dollar pattern?

PROGRAM :-

```
import java.util.*;
public class hallowsquare {
public static void main(String[]args)
{
int m,n,i,j;
String s;
Scanner v = new Scanner (System.in);
System.out.println("enter the symbol :");
s = v.nextLine();
System.out.println("enter the number of rows :");
m = v.nextInt();
System.out.println("enter the number of column :");
n = v.nextInt();
for (i=1;i<m+1;i++)
{
for (j=1;j<n+1;j++)
{
if(i == 1 || i == m || j == 1 || j == n)
{
System.out.print(s+" ");
}
else
{
System.out.print("  ");
}
}
System.out.println();
}
}
}
```

OUT PUT :-

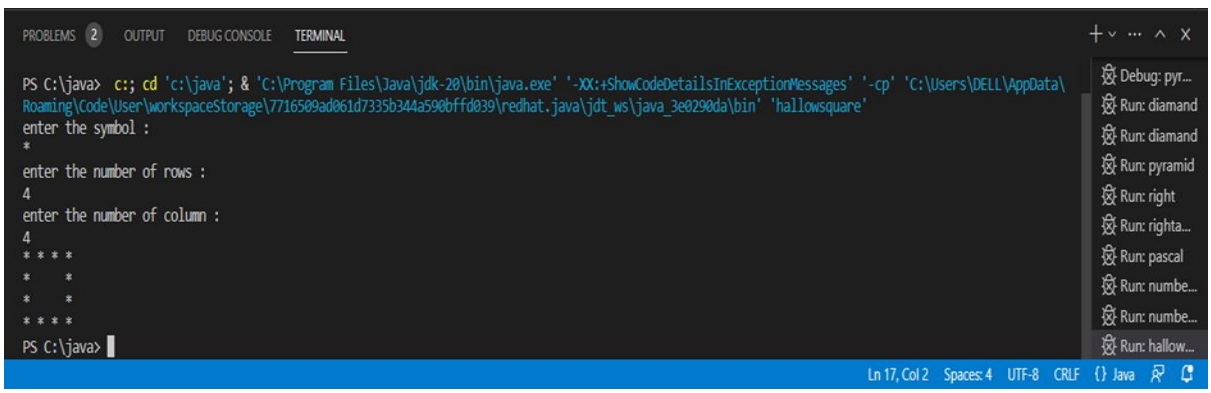


8) Write a program to print hollow square symbol pattern?

PROGRAM :-

```
import java.util.*;
public class hallowsquare {
public static void main(String[]args)
{
int m,n,i,j;
String s;
Scanner v = new Scanner (System.in);
System.out.println("enter the symbol :");
s = v.nextLine();
System.out.println("enter the number of rows :");
m = v.nextInt();
System.out.println("enter the number of column :");
n = v.nextInt();
for (i=1;i<m+1;i++)
{
for (j=1;j<n+1;j++)
{
if(i == 1 || i == m || j == 1 || j == n)
{
System.out.print(s+" ");
}
else
{
System.out.print("  ");
}
}
System.out.println();
}
}
}
```

OUTPUT :-



9) Given an integer x, return true if x is a Palindrome , and false otherwise.

Example 1:

Input: x = 121

Output: true

Explanation: 121 reads as 121 from left to right and from right to left.

PROGRAM :-

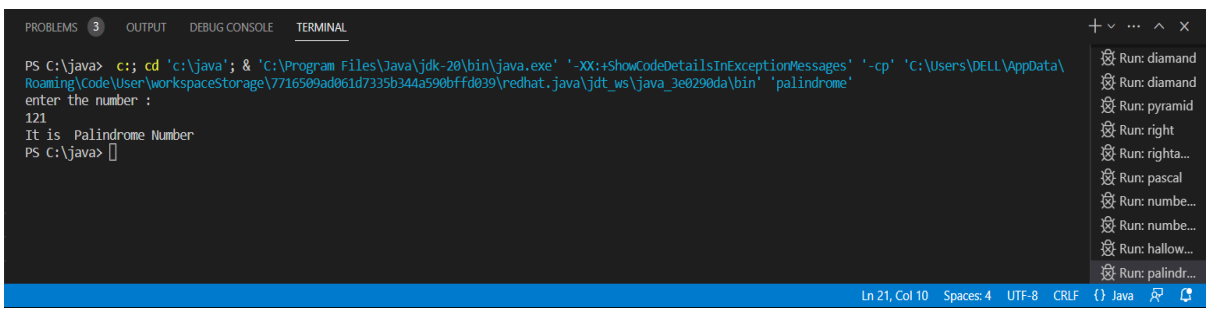
```java
import java.util.*;
public class palindrome
{

    public static void main(String[] args) {
        int num,r,reversed=0;
        Scanner v = new Scanner(System.in);
        System.out.println("enter the number :");
        num = v.nextInt();
        int original = num;
        while(num!=0)
        {
            r = num%10;
            reversed = reversed*10+r;
            num/=10;
        }

        if(original==reversed)
        {
            System.out.println("It is  Palindrome Number");
        }
        else
        {
            System.out.println("It is not Palindrome Number");
        }
    }

}
```

OUTPUT :-

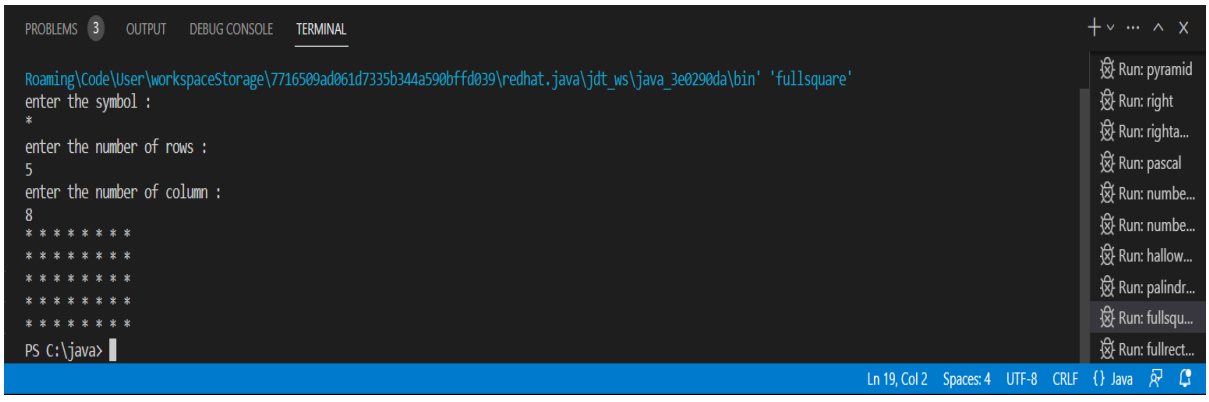


10) Write a program to print rectangle symbol pattern. Get the symbol as input from user

PROGRAM :-

```
import java.util.*;
public class fullrectangle {
public static void main(String[]args)
{
int m,n,i,j;
String s;
Scanner v = new Scanner (System.in);
System.out.println("enter the symbol :");
s = v.nextLine();
System.out.println("enter the number of rows :");
m = v.nextInt();
System.out.println("enter the number of column :");
n = v.nextInt();
for (i=1;i<m+1;i++)
{
for (j=1;j<n+1;j++)
{
System.out.print(s+" ");
}
System.out.println();
}
}
}
```

OUTPUT :-



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

PROGRAM :-

```
import java.util.Scanner;
public class matrixaddition {
    public static void main(String[] args) {
      int i,j;
       Scanner s = new Scanner(System.in);
        System.out.println("Enter no of rows:");
        i = s.nextInt();
        System.out.println("Enter no of columns:");
        j = s.nextInt();

        int a[][] = new int[i][j];
        int b[][] = new int[i][j];
        int c[][] = new int[i][j];

       System.out.println("Mat1 =");
       for(i=0;i<2;i++)
       {
           for(j=0;j<2;j++)
           {
                a[i][j] = s.nextInt();

           }
       }
       System.out.println("Mat2 =");
       for(i=0;i<2;i++)
       {
           for(j=0;j<2;j++)
           {
               b[i][j] = s.nextInt();

           }
```

```
          }
        System.out.println("Mat Sum =");
        for(i=0;i<2;i++)
        {
            for(j=0;j<2;j++)
            {
                c[i][j] = a[i][j]+b[i][j];
                System.out.print(c[i][j]+"   ");
            }
            System.out.println();
        }
    }
}
```

OUTPUT :-

12) Write a program to print inverted pyramid pattern.

Input: no of rows: 3

Output

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

PROGRAM :-

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

```
        {
            int rows;
            Scanner v = new Scanner(System.in);
            System.out.println("enter the number :");
            rows = v.nextInt();
            for (int i = rows; i >= 1; i--) {
                for (int j = 1; j <= rows-i; j++)
                {
                    System.out.print("  ");
                }
                for (int k = 1; k <= 2*i-1; k++)
                {
                    System.out.print("* ");
                }
                System.out.println();
            }
        }
    }
```

OUTPUT :-

13) Write a program to print the below pattern

1

2 2

3 3 3

4 4 4 4

PROGRAM :-

```
import java.util.*;
public class numpattern1 {
public static void main(String[] args)
```

```
{
int i, j, rows;
Scanner sc = new Scanner(System.in);
System.out.print("Enter the number of rows you want to print: ");
rows = sc.nextInt();
for (i = 1; i <= rows; i++)
{
for (j = 1; j <= i; j++)
{
System.out.print(i+" ");
}
System.out.println();
}
}
}
```

OUTPUT :-

14) Write a program to print the below pattern

1

2 2

3 3 3

4 4 4 4

3 3 3

2 2

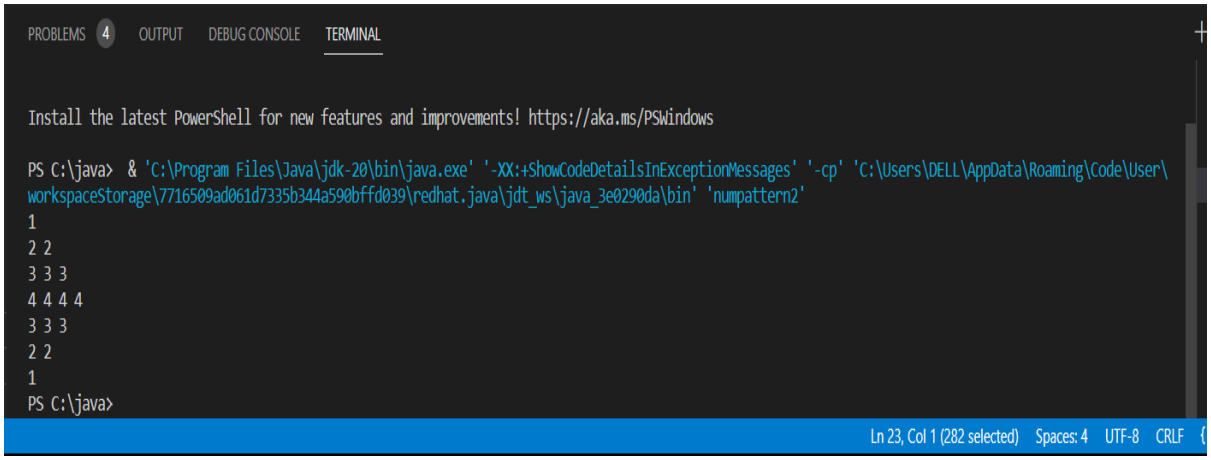
1

PROGRAM :-

```
public class numpattern2 {
public static void main(String[] args)
```

```
{
int i,j;
for(i=1;i<5;i++)
{
for(j=1;j<=i;j++)
{
System.out.print(i+" ");
}
System.out.println();
}
for(i=3;i>0;i--)
{
for(j=i;j>0;j--)
{
System.out.print(i+" ");
}
System.out.println();
}
}
}
```

OUTPUT :-



15) Write a program to print the below pattern

1

4 9

16 25 36

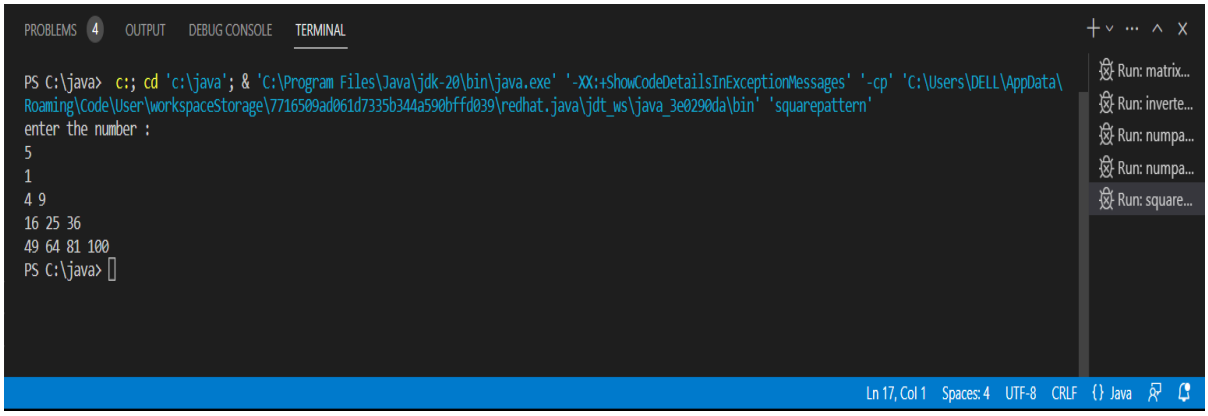
49 64 81 100

PROGRAM :-

```java
import java.util.*;
public class squarepattern {
    public static void main(String[] args){
        Scanner sc=new Scanner(System.in);
        System.out.println("enter the number :");
        int n=sc.nextInt();
        int a,b,k=1;
        for(a=1;a<n;a++){
            for(b=1;b<=a;b++){
                System.out.print((int)Math.pow((k++),2)+" ");
            }
            System.out.println();
           }
        }

    }
```

OUTPUT :-



16) Write a program for matrix multiplication?

Sample Input:

Mat1 = 1 2

5 3

Mat2 = 2 3

4 1

Sample Output:

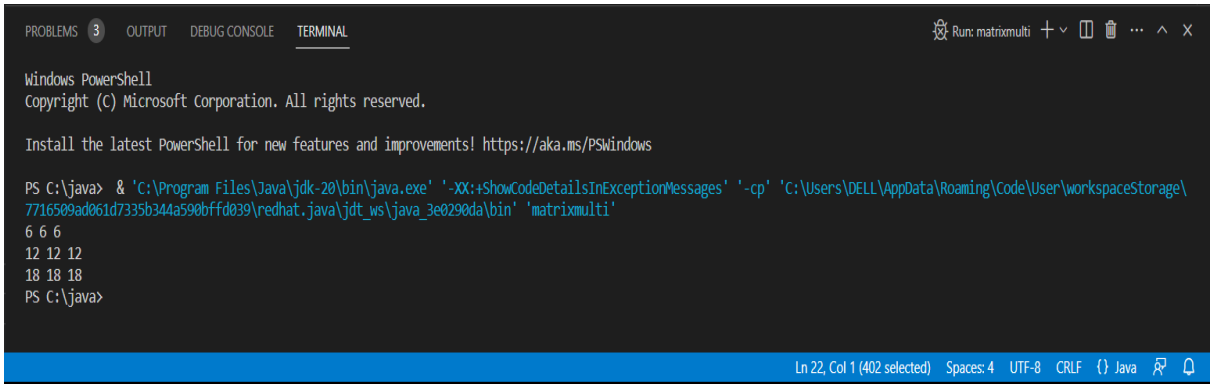
Mat Sum = 10 5

22 18

PROGRAM :-

```java
public class matrixmulti {
public static void main(String args[])
{
int a[][]={{1,1,1},{2,2,2},{3,3,3}};
int b[][]={{1,1,1},{2,2,2},{3,3,3}};
int c[][]=new int[3][3];
for(int i=0;i<3;i++)
{
for(int j=0;j<3;j++)
{
c[i][j]=0;
for(int k=0;k<3;k++)
{
c[i][j]+=a[i][k]*b[k][j];
}
System.out.print(c[i][j]+" ");
}
System.out.println();
}
}
}
```

OUTPUT :-



17) Given a non-negative integer x, return the square root of x rounded down to the

nearest integer. The returned integer should be non-negative as well.

You must not use any built-in exponent function or operator.

For example, do not use pow(x, 0.5) in c++ or x ** 0.5 in python.

Example 1:

Input: x = 4

Output: 2

Explanation: The square root of 4 is 2, so we return 2.

Example 2:

Input: x = 8

Output: 2

Explanation: The square root of 8 is 2.82842..., and since we round it down to the nearest

integer, 2 is returned.

```
class Solution {
   int mySqrt(int x) {


   }
}
```

PROGRAM :-

```
public class square {
        public int mySqrt(int x) {
           if (x < 2) return x;
            int end = x / 2;
            int start = 1;
            while (start <= end) {
                int mid = (start + end) / 2;
                if ((long)mid*mid > x) {
                    end = mid - 1;
                } else {
                    start = mid + 1;
                }
            }
            return end;
        }
    }
```

18) 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

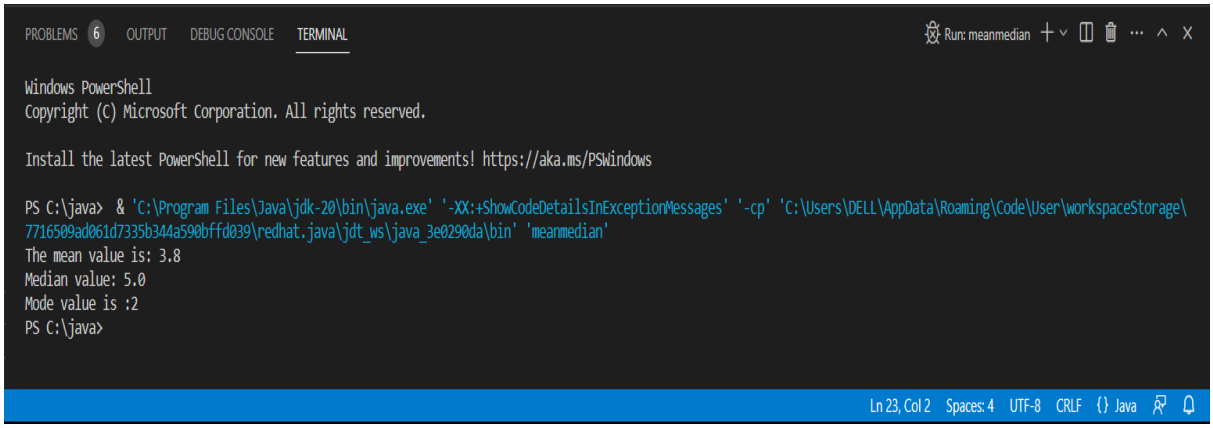
PROGRAM :-

```
import java.io.*;
import java.lang.*;
public class meanmedian {

public static void main(String[] args)
{
int[] invalue = new int[]{2,4,5,2,6};
int num_value=5;
double tot=0;
double mean=0;
for(int i=0; i<num_value; i++)
{
tot = tot+invalue[i];
}
mean = tot/num_value;
System.out.println("The mean value is: "+mean);
double median = 0;
double mid=0;
if(num_value%2 == 0)
{
int temp=(num_value/2)-1;
for(int i=0;i<num_value;i++)
{
if(temp==i || (temp+1)==i)
{
mid=mid+invalue[i];
}
}
mid=mid/2;
System.out.println("Median value is: "+mid);
}
else
{
int temp=(num_value/2);
for(int i=0;i<num_value;i++)
{
if(temp==i)
{
```

```
mid=invalue[i];
System.out.println("Median value: "+mid);
}
}
}
int i,j,z, tmp, maxCount, modeValue;
int[] tally=new int[num_value];
for(i=0;i<num_value;i++)
{
for(j=0;j<num_value-i;j++)
{
if(j+1!=num_value)
{
if(invalue[j]>invalue[j+1])
{
tmp=invalue[j];
invalue[j]=invalue[j+1];
invalue[j+1]=tmp;
}
}
}
}
for (i = 0; i < num_value; i++)
{
for(z=i+1;z<num_value;z++)
{
if(invalue[i]==invalue[z])
{
tally[i]++;
}
}
}
maxCount = 0;
modeValue = 0;
for (i = 0; i <num_value; i++)
{
if (tally[i] > maxCount)
{
maxCount = tally[i];
modeValue = invalue[i];
}
}
System.out.println("Mode value is :"+modeValue);
}
}
```

OUTPUT :-


PROBLEMS 6
OUTPUT
DEBUG CONSOLE
TERMINAL
Run: meanmedian
Windows PowerShell
Copyright (C) Microsoft Corporation. All rights reserved.
Install the latest PowerShell for new features and improvements! https://aka.ms/PSWindows
PS C:\java> & 'C:\Program Files\Java\jdk-20\bin\java.exe' '-XX:+ShowCodeDetailsInExceptionMessages' '-cp' 'C:\Users\DELL\AppData\Roaming\Code\User\workspaceStorage\7716509ad061d7335b344a590bffd039\redhat.java\jdt_ws\java_3e0290da\bin' 'meanmedian'
The mean value is: 3.8
Median value: 5.0
Mode value is :2
PS C:\java>
Ln 23, Col 2
Spaces: 4
UTF-8
CRLF
{} Java