ARRAYS

Two Dimensional Arrays

Program 1:

```
package array2d;

public class Array {

	public static void main(String[] args) {

		int marks[][]=new int[3][4];

		marks[0][0]=51;

		marks[0][1]=52;

		marks[0][2]=53;

		marks[0][3]=54;

		marks[1][0]=61;

		marks[1][1]=62;

		marks[1][2]=63;

		marks[1][3]=64;

		marks[2][0]=71;

		marks[2][1]=72;

		marks[2][2]=73;

		marks[2][3]=74;

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

		{

			for(int j=0;j<marks[i].length;j++)

			{
```

```
                    System.out.print(marks[i][j]+" ");
                }
                System.out.println();
            }
        }

}
```

Output:

Program 2:

```
package array2d;

import java.util.Scanner;

public class Array1 {

    public static void main(String[] args) {

        Scanner scan=new Scanner(System.in);

        System.out.println("please enter number of classes(rows)");

        int rows=scan.nextInt();

        System.out.println("Please enter number of students in each
class(columns");
```

```
            int columns=scan.nextInt();
            //creating array
            int marks[][]=new int[rows][columns];
            //storing marks for classes
            for(int i=0;i<rows;i++)
            {
                  for(int j=0;j<columns;j++)
                  {
                        System.out.println("Please enter marks");
                        marks[i][j]=scan.nextInt();
                  }
            }
            //printing marks for classes
            for(int i=0;i<rows;i++)
            {
                  for(int j=0;j<columns;j++)
                  {
                        System.out.print(marks[i][j]+" ");
                  }
                  System.out.println();
            }
      }
}
```

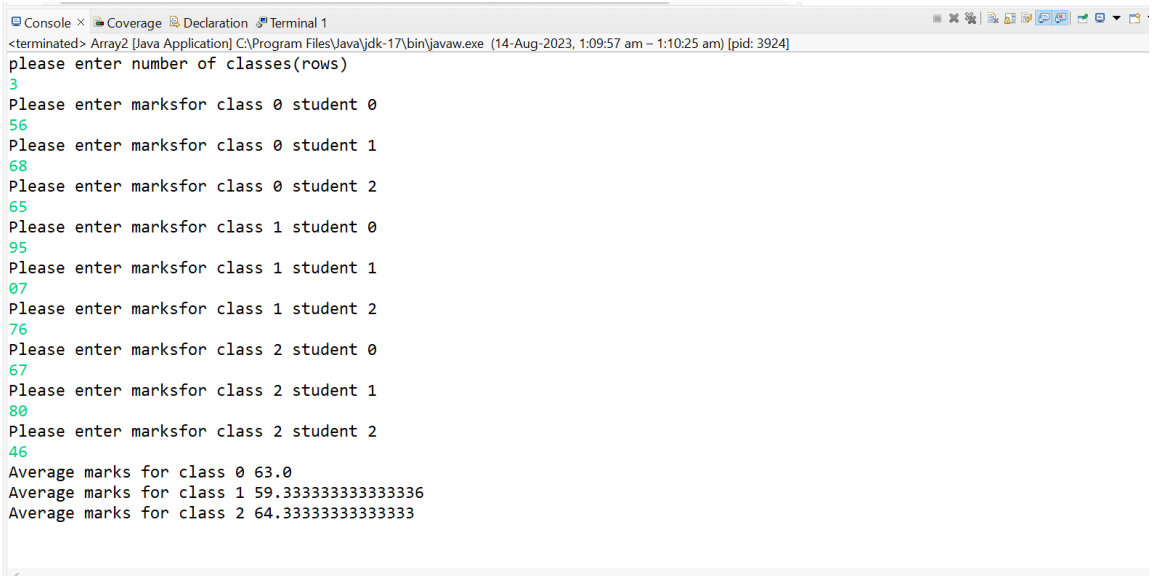
Output:

Program 3:

```
package array2d;

import java.util.Scanner;

public class Array2 {

	public static void main(String[] args) {


		Scanner scan=new Scanner(System.in);

		System.out.println("please enter number of classes(rows)");

		int rows=scan.nextInt();


		//creating array

		int marks[][]=new int[rows][rows];

		//storing marks for classes

		for(int i=0;i<rows;i++)

		{

			for(int j=0;j<rows;j++)

			{

				System.out.println("Please enter marksfor class "+i+" "+"student " +j);
```

```
                        marks[i][j]=scan.nextInt();
                  }
            }
            //printling marks for classes
            for(int i=0;i<rows;i++)
            {
                  double sum=0.0;
                  for(int j=0;j<rows;j++)
                  {
                        sum=sum+marks[i][j];
                  }
                  double result=sum/rows;
                  System.out.println("Average marks for class "+i+"
"+result );
            }
      }
}
```

Output:

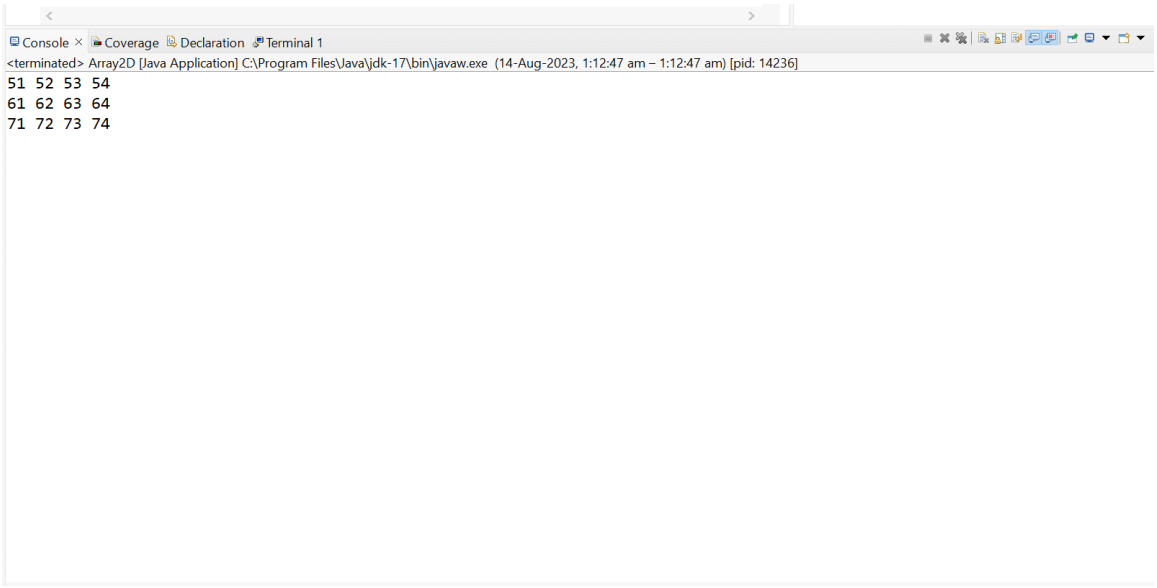


Program 4:

```
package array2d;

public class Array2D {

	public static void main(String[] args) {

		int marks[][]=new int[3][4];

		marks[0][0]=51;

		marks[0][1]=52;

		marks[0][2]=53;

		marks[0][3]=54;

		marks[1][0]=61;

		marks[1][1]=62;

		marks[1][2]=63;

		marks[1][3]=64;

		marks[2][0]=71;

		marks[2][1]=72;

		marks[2][2]=73;

		marks[2][3]=74;

		System.out.print(marks[0][0]+" ");

		System.out.print(marks[0][1]+" ");

		System.out.print(marks[0][2]+" ");

		System.out.print(marks[0][3]+" ");

		System.out.println();

		System.out.print(marks[1][0]+" ");

		System.out.print(marks[1][1]+" ");

		System.out.print(marks[1][2]+" ");
```

```
            System.out.print(marks[1][3]+" ");
            System.out.println();
            System.out.print(marks[2][0]+" ");
            System.out.print(marks[2][1]+" ");
            System.out.print(marks[2][2]+" ");
            System.out.print(marks[2][3]+" ");
      }
}
```

Output:

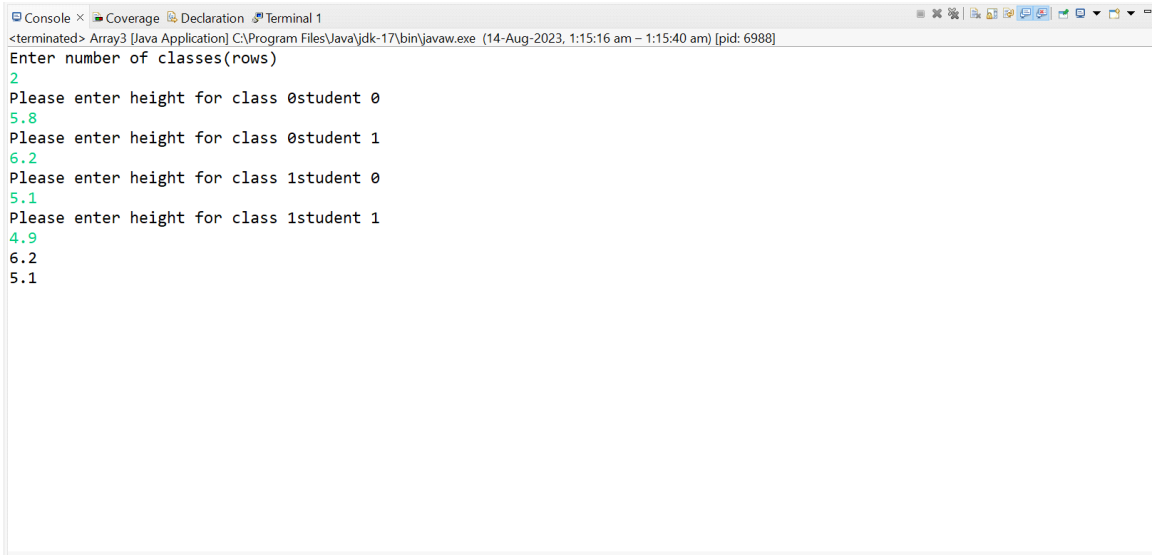


Program 5:

```
package array2d;
import java.util.Scanner;
public class Array3 {
      public static void main(String[] args) {

            Scanner scan=new Scanner(System.in);
            System.out.println("Enter number of classes(rows)");
```

```
            int rows=scan.nextInt();
            double height[][]=new double [rows][rows];
            for(int i=0;i<rows;i++)
            {
                  for(int j=0;j<rows;j++)
                  {
                        System.out.println("Please enter height for class
"+i+"student "+j);
                        height[i][j]=scan.nextDouble();
                  }
            }
            for(int i=0;i<rows;i++)
            {
                  double maxheight=0.0;
                  for(int j=0;j<rows;j++)
                  {
                        if(height[i][j]>maxheight)
                        {
                        maxheight=height[i][j];

                        }

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

}
```

Output:

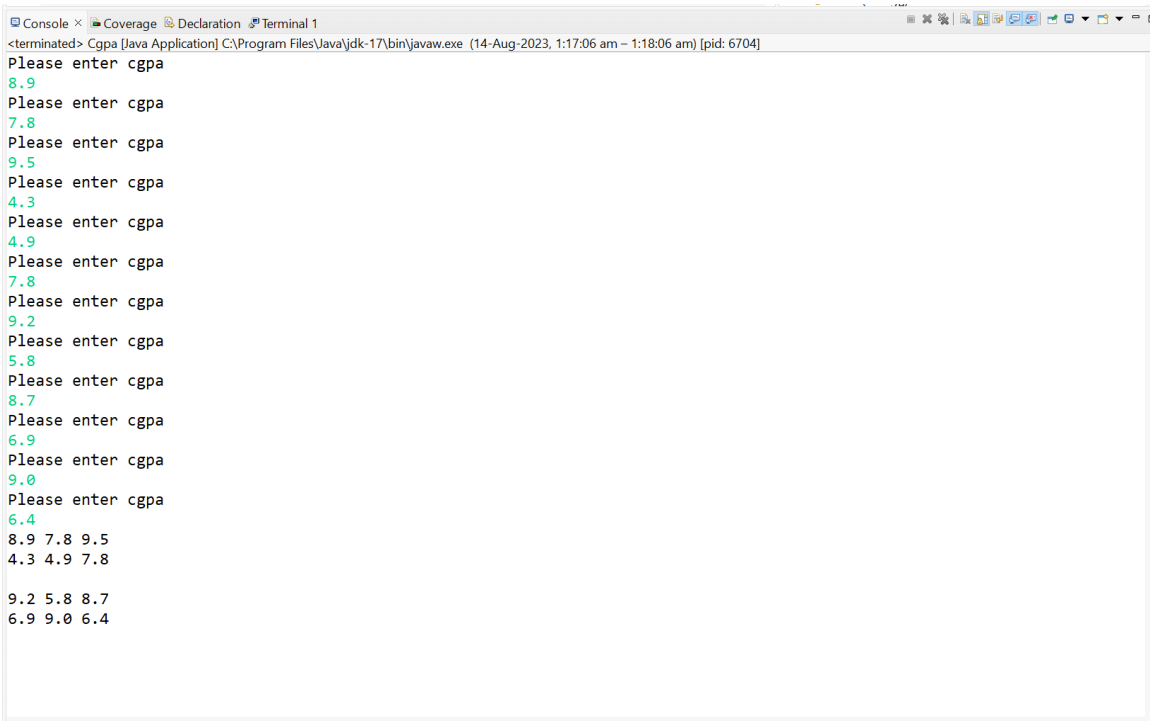


Program 6:

```
package array2d;

import java .util.Scanner;

public class Cgpa {

	public static void main(String[] args) {

		double[][][] cgpa=new double[2][2][3];

		Scanner scan=new Scanner(System.in);

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

		{

			for(int j=0;j<cgpa[i].length;j++)

			{

				for(int k=0;k<cgpa[i][j].length;k++)

				{

					System.out.println("Please enter cgpa");

					cgpa[i][j][k]=scan.nextDouble();

				}
```

```
            }
        }
        for(int i=0;i<cgpa.length;i++)
        {
            for(int j=0;j<cgpa[i].length;j++)

            {
                for(int k=0;k<cgpa[i][j].length;k++)
                {
                    System.out.print(cgpa[i][j][k]+" ");
                }
                System.out.println();
            }
            System.out.println();
        }
    }
}
```

Output:



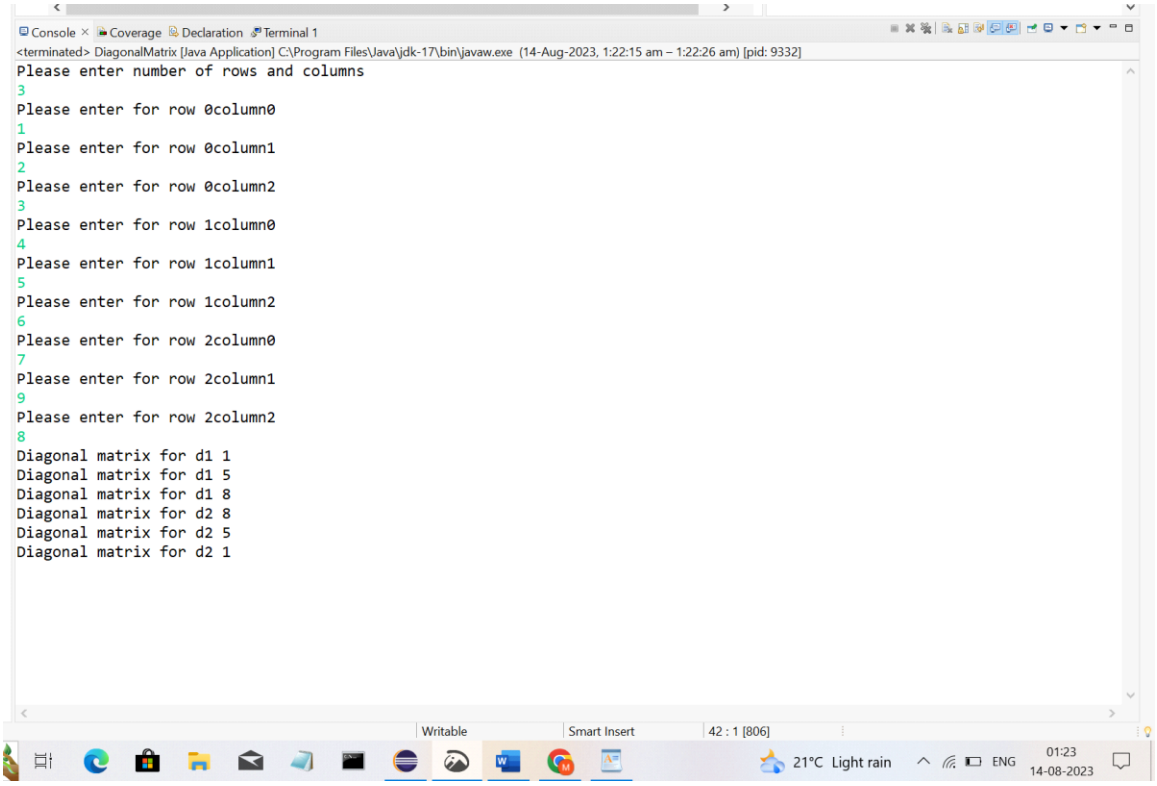
Program 7:

```
package array2d;

import java.util.Scanner;

public class DiagonalMatrix {

	public static void main(String[] args) {

		Scanner scan=new Scanner(System.in);

		System.out.println("Please enter number of rows and columns");

		int n=scan.nextInt();

		int matrix[][]=new int[n][n];

		for(int i=0;i<n;i++)

		{

			for (int j=0;j<n;j++)

			{

				System.out.println("Please enter for row
"+i+"column"+j);
```

```
                        matrix[i][j]=scan.nextInt();
                  }
            }
            for (int i=0;i<n;i++)
            {
                  for(int j=0;j<n;j++)
                  {
                        if(i==j)
                        {

                              System.out.println("Diagonal matrix for d1
"+matrix[i][j]);
                        }
                  }

            }
            for(int i=n;i>=0;i--)
            {
                  for(int j=0;j<n;j++ )
                  {
                        if(i==j)
                        {
                              System.out.println("Diagonal matrix for d2
"+matrix[i][j]);
                        }
                  }
            }
      }
```

}

Output:

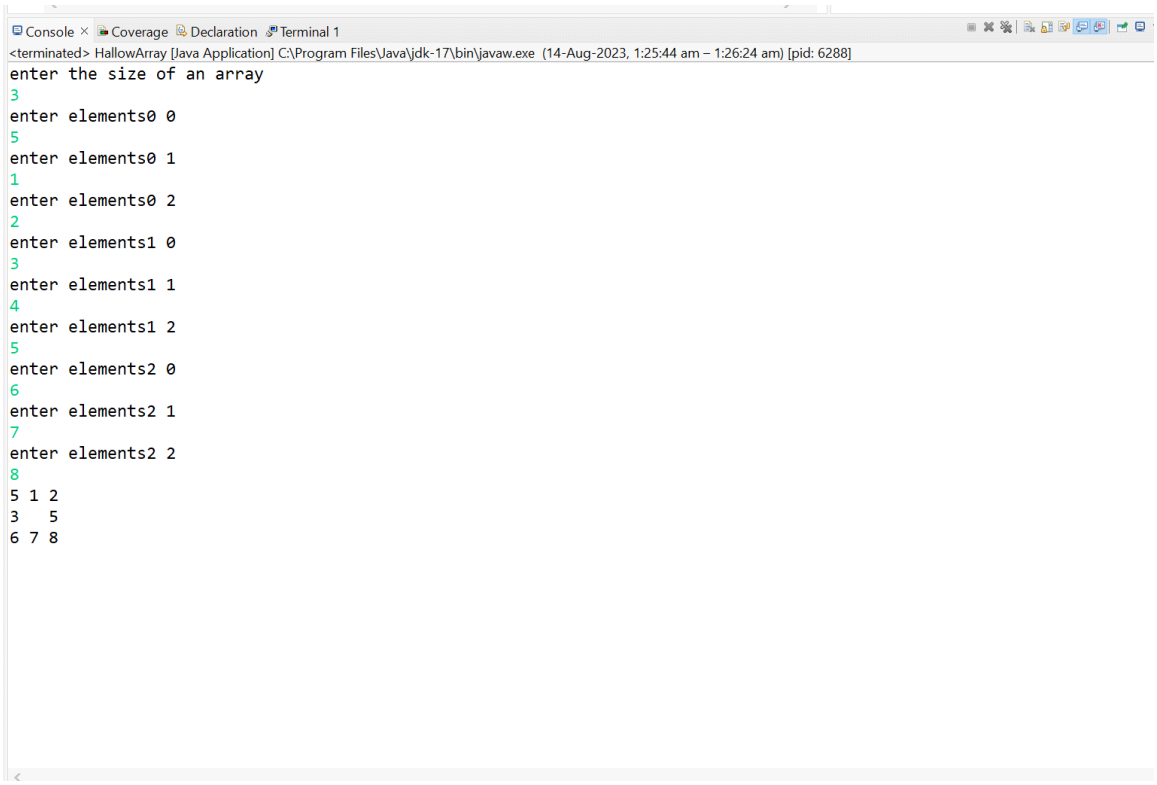


Program 8:

```
package array2d;

import java.util.Scanner;

public class HallowArray {

	public static void main(String[] args) {

		Scanner scan=new Scanner(System.in);

		System.out.println("enter the size of an array");

		int n=scan.nextInt();

		int a[][]=new int[n][n];

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

		{
```

```
                for(int j=0;j<a[i].length;j++)
                {
                        System.out.println("enter elements"+i+" "+j);
                        a[i][j]=scan.nextInt();
                }
        }
        for(int i=0;i<a.length;i++)
        {
                for(int j=0;j<a[i].length;j++)
                {
                        if(i==0||i==n-1||j==0||j==n-1)
                        {
                        System.out.print(a[i][j]+" ");
                        }
                        else
                        {
                                System.out.print("  ");
                        }
                }
                System.out.println();
        }
    }

}
```

Output:

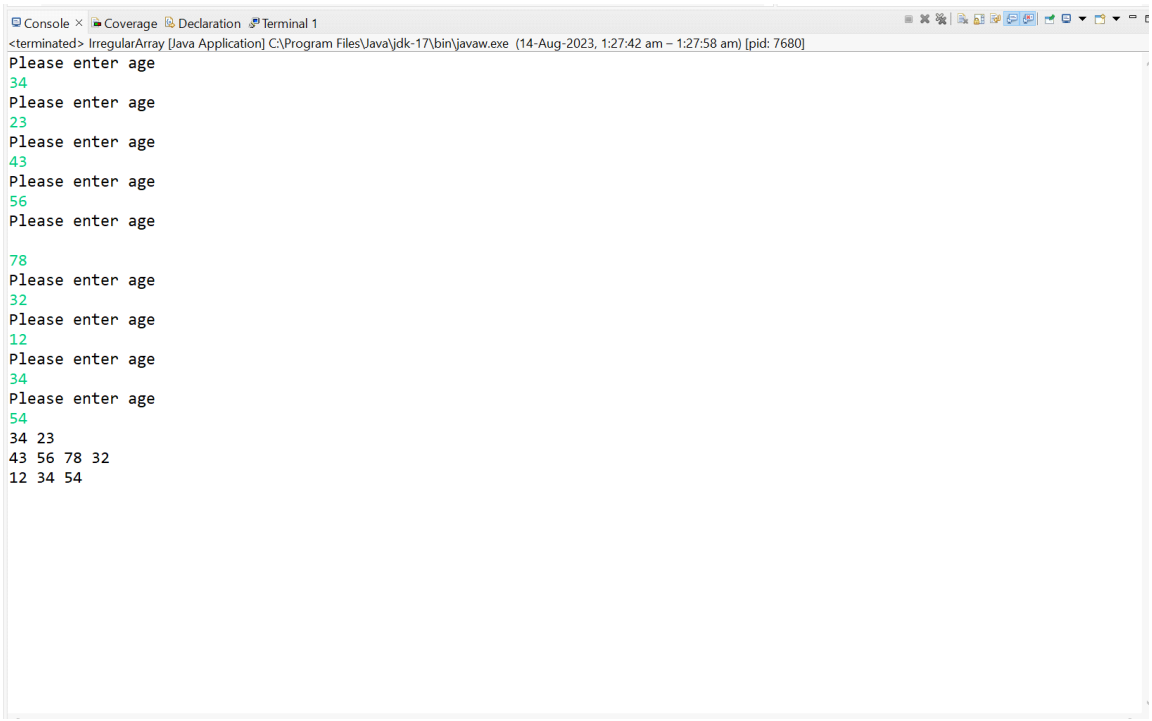


Program 9:

```
package array2d;

import java.util.Scanner;

public class IrregularArray {

	public static void main(String[] args) {

		int age[][]=new int[3][];

		age[0]=new int[2];

		age[1]=new int[4];

		age[2]=new int[3];

		Scanner scan=new Scanner(System.in);

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

		{

			for(int j=0;j<age[i].length;j++)

			{
```

```
                    System.out.println("Please enter age");
                    age[i][j]=scan.nextInt();

                }
            }
            for(int i=0;i<age.length;i++)
            {
                for(int j=0;j<age[i].length;j++)

                {
                    System.out.print(age[i][j]+" ");
                }
                System.out.println();
            }

        }
}
```

Output:



Program 10:

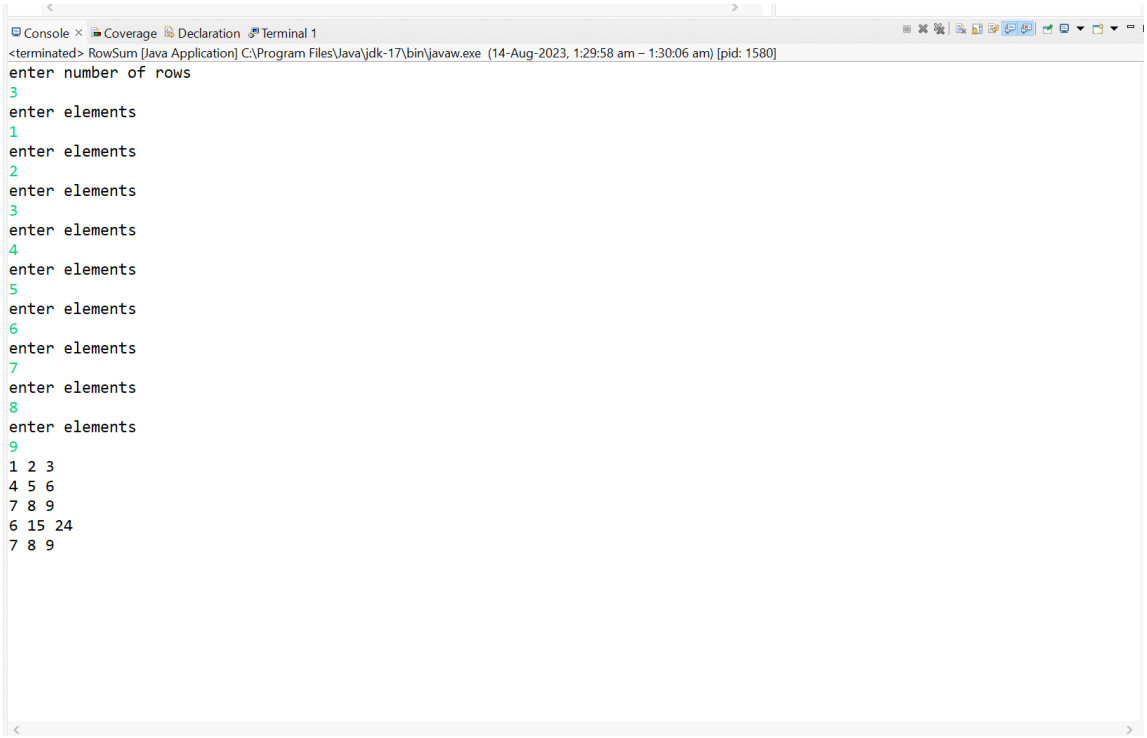
```
package array2d;

import java.util.Scanner;

public class RowSum {

	public static void main(String[] args) {

		Scanner scan=new Scanner(System.in);

		System.out.println("enter number of rows");

		int n=scan.nextInt();


		int a[][]=new int[n][n];

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

		{

			for(int j=0;j<a[i].length;j++)

			{

				System.out.println("enter elements");
```

```
            a[i][j]=scan.nextInt();
      }
}
for(int i=0;i<a.length;i++)
{
      for( int j=0;j<a[i].length;j++)
      {
            System.out.print(a[i][j]+" ");
      }
      System.out.println();
}
//storing sum in a array
int max[]=new int [n];

for(int i=0;i<a.length;i++)
{
      int sum=0;
      for(int j=0;j<a[i].length;j++)
      {
            sum=sum+a[i][j];


      }
      max[i]=sum;
      System.out.print(sum+" ");
}
System.out.println();
//finding maximum
```

```
int m=0;
for(int i=0;i<max.length;i++)
{
	if(max[i]>m)
	{
		m=max[i];
	}
}

//finding index
int ind=0;
for(int i=0;i<max.length;i++)
{
	if(max[i]==m)
	{
		ind=i;
	}
}
//row printing
for(int i=0;i<a.length;i++)
{
	for(int j=0;j<a[i].length;j++)
	{
		if(i==ind)
		{
			System.out.print(a[i][j]+" ");
		}
```

```
                }
            }
        }
}
```

Output:



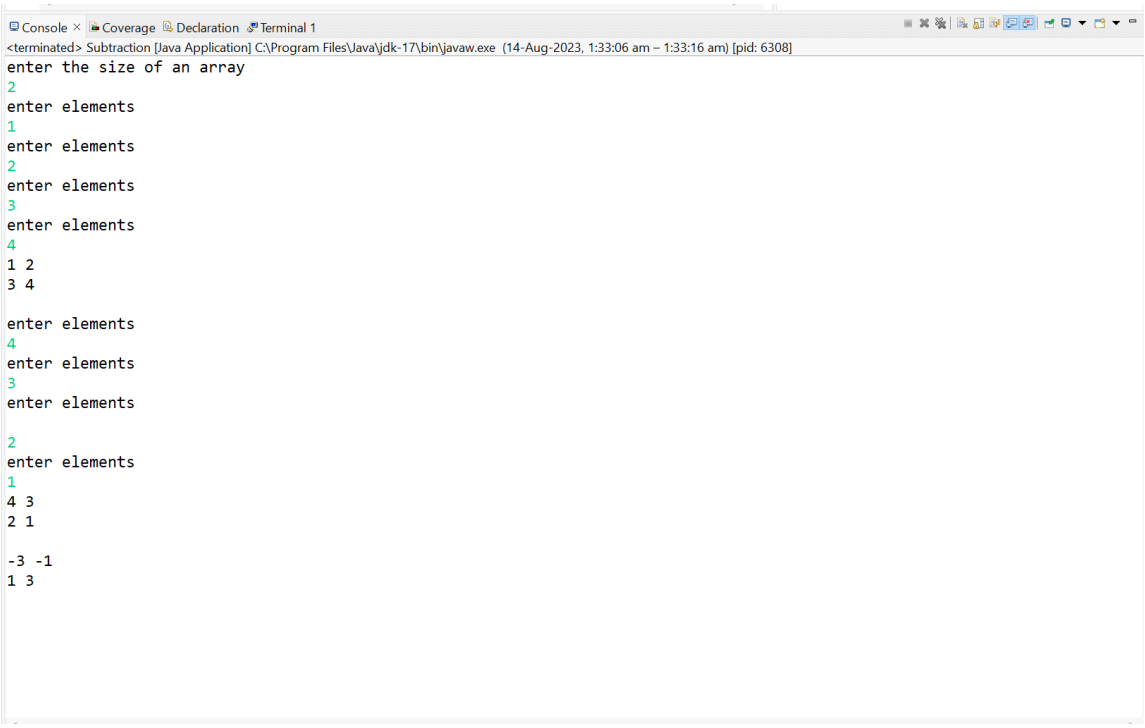
Program 11:

```
package array2d;

import java.util.Scanner;

public class Subtraction {

      public static void main(String[] args) {

            Scanner scan= new Scanner(System.in);

            System.out.println("enter the size of an array");

            int n=scan.nextInt();

            int a[][]=new int[n][n];
```

```
int b[][]=new int[n][n];
int c[][]=new int[n][n];
for(int i=0;i<a.length;i++)
{
      for(int j=0;j<a[i].length;j++)
      {
            System.out.println("enter elements");
            a[i][j]=scan.nextInt();
      }
}
for(int i=0;i<a.length;i++)
{
      for(int j=0;j<a[i].length;j++)
      {
            System.out.print(a[i][j]+" ");
      }
      System.out.println();
}
System.out.println();
for(int i=0;i<b.length;i++)
{
      for(int j=0;j<b[i].length;j++)
      {
            System.out.println("enter elements");
            b[i][j]=scan.nextInt();
      }
}
```

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

Output:



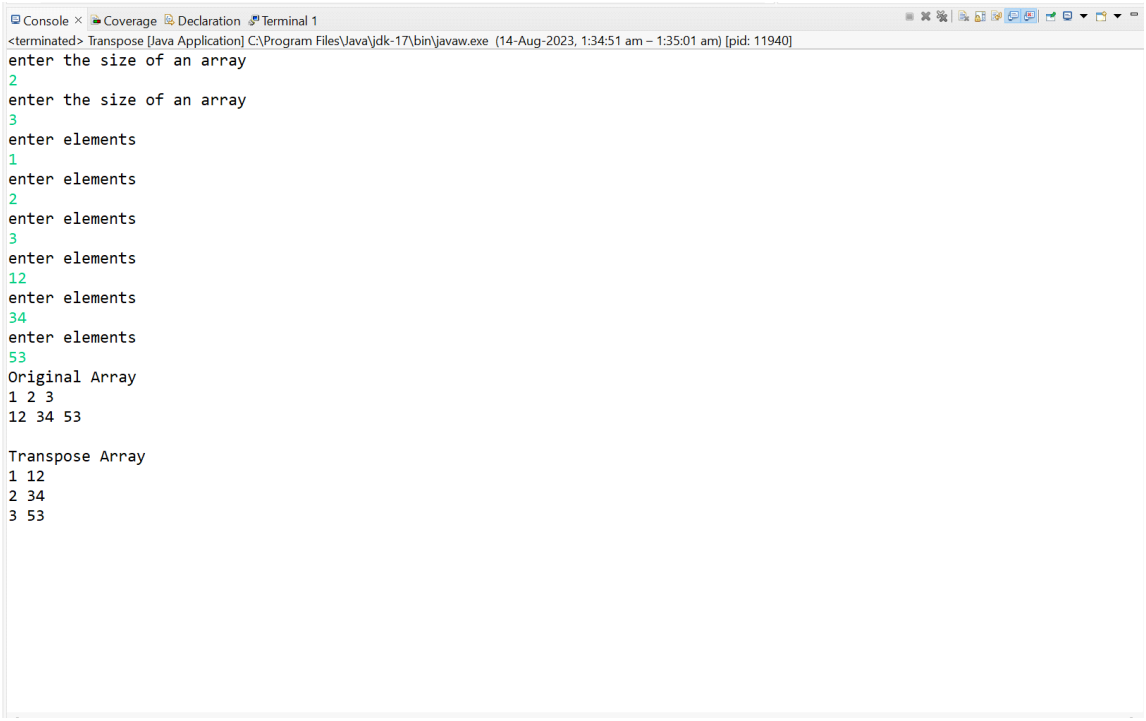
Program 12:

```
package array2d;


import java.util.Scanner;
public class Transpose {
	public static void main(String[] args) {
		Scanner scan= new Scanner(System.in);
		System.out.println("enter the size of an array");
		int rows=scan.nextInt();
		System.out.println("enter the size of an array");
		int columns=scan.nextInt();
		int a[][]=new int[rows][columns];
		int b[][]=new int[columns][rows];
		for(int i=0;i<a.length;i++)
		{
```

```
            for(int j=0;j<a[i].length;j++)
            {
                  System.out.println("enter elements");
                  a[i][j]=scan.nextInt();
            }
      }
      System.out.println("Original Array");
      for(int i=0;i<a.length;i++)
      {
            for(int j=0;j<a[i].length;j++)
            {
                  System.out.print(a[i][j]+" ");
            }
            System.out.println();
      }
      System.out.println();
      System.out.println("Transpose Array");
      for(int i=0;i<b.length;i++)
      {
            for(int j=0;j<b[i].length;j++)
            {
                  b[i][j]=a[j][i];
                  System.out.print(b[i][j]+" ");
            }
            System.out.println();
      }
}
```

```
}
```

Output:


Console
Coverage
Declaration
Terminal 1
<terminated> Transpose [Java Application] C:\Program Files\Java\jdk-17\bin\javaw.exe (14-Aug-2023, 1:34:51 am – 1:35:01 am) [pid: 11940]
enter the size of an array
2
enter the size of an array
3
enter elements
1
enter elements
2
enter elements
3
enter elements
12
enter elements
34
enter elements
53
Original Array
1 2 3
12 34 53
Transpose Array
1 12
2 34
3 53