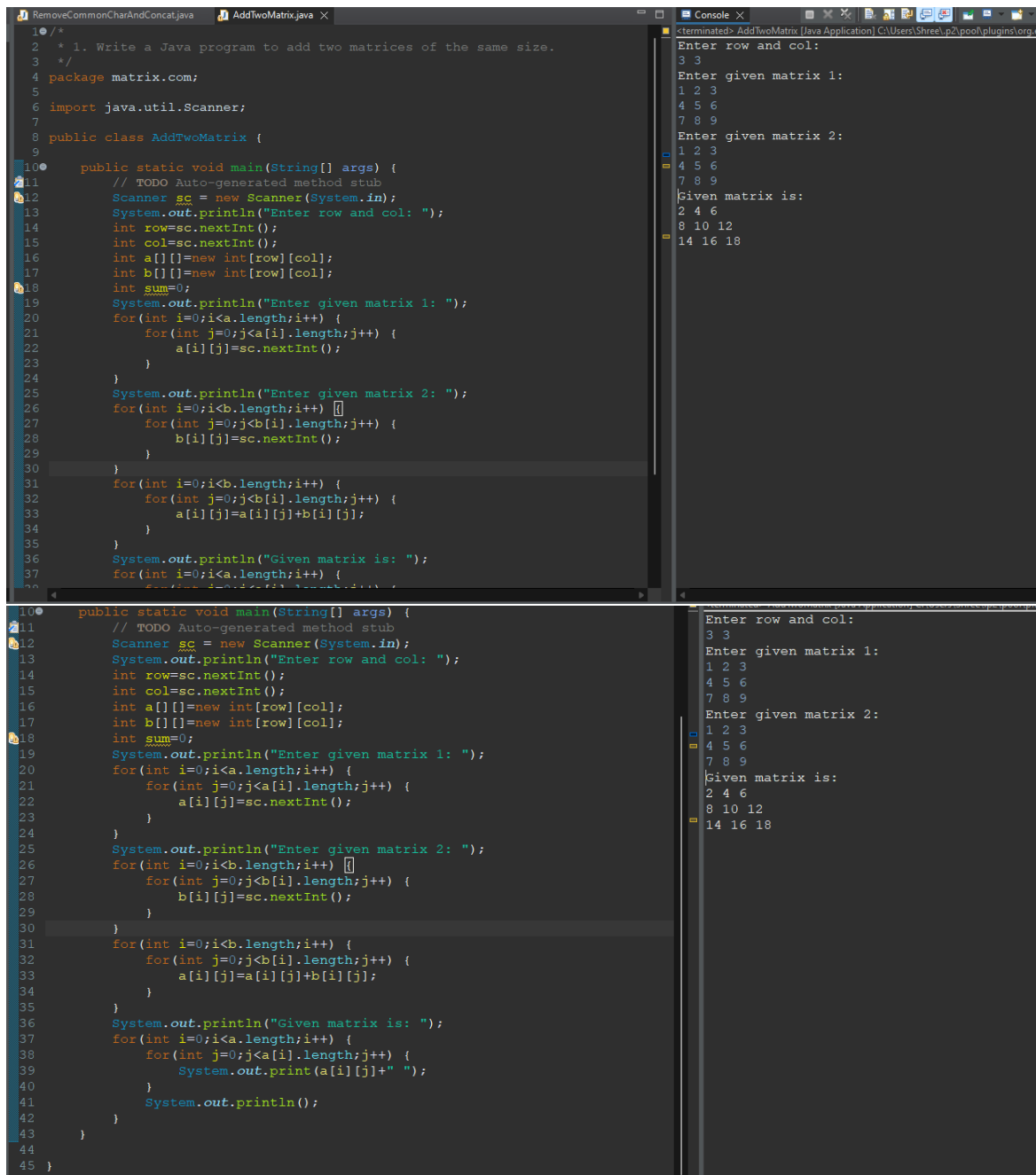


Assignment No:-34

Name:-Suryawanshi Sangramsingh Sambhaji

Batch: - Delta - DCA (Java) 2024 Date:-23/6/2024

1. Write a Java program to add two matrices of the same size.

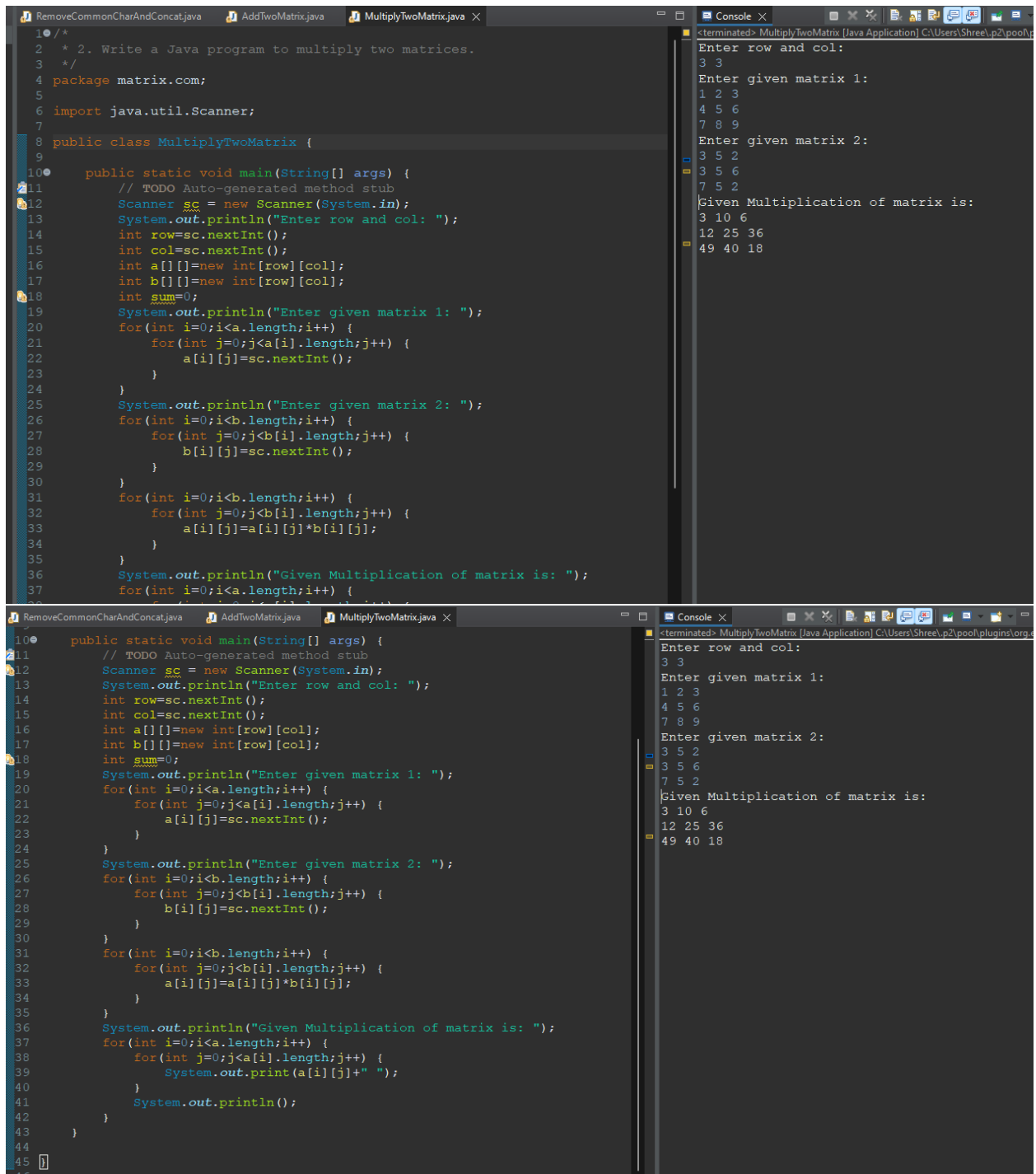


```
10 RemoveCommonCharAndConcat.java AddTwoMatrix.java X Console X
2 1. Write a Java program to add two matrices of the same size.
3 */
4 package matrix.com;
5
6 import java.util.Scanner;
7
8 public class AddTwoMatrix {
9
10     public static void main(String[] args) {
11         // TODO Auto-generated method stub
12         Scanner sc = new Scanner(System.in);
13         System.out.println("Enter row and col: ");
14         int row=sc.nextInt();
15         int col=sc.nextInt();
16         int a[][]=new int[row][col];
17         int b[][]=new int[row][col];
18         int sum=0;
19         System.out.println("Enter given matrix 1: ");
20         for(int i=0;i<a.length;i++) {
21             for(int j=0;j<a[i].length;j++) {
22                 a[i][j]=sc.nextInt();
23             }
24         }
25         System.out.println("Enter given matrix 2: ");
26         for(int i=0;i<b.length;i++) {
27             for(int j=0;j<b[i].length;j++) {
28                 b[i][j]=sc.nextInt();
29             }
30         }
31         for(int i=0;i<b.length;i++) {
32             for(int j=0;j<b[i].length;j++) {
33                 a[i][j]=a[i][j]+b[i][j];
34             }
35         }
36         System.out.println("Given matrix is: ");
37         for(int i=0;i<a.length;i++) {
38             for(int j=0;j<a[i].length;j++) {
39                 System.out.print(a[i][j]+" ");
40             }
41             System.out.println();
42         }
43     }
44 }
45 }
```

```
<terminated> AddTwoMatrix [Java Application] C:\Users\Shree\p2\pool\plugins\org.e
Enter row and col:
3 3
Enter given matrix 1:
1 2 3
4 5 6
7 8 9
Enter given matrix 2:
1 2 3
4 5 6
7 8 9
Given matrix is:
2 4 6
8 10 12
14 16 18
```

```
Enter row and col:
3 3
Enter given matrix 1:
1 2 3
4 5 6
7 8 9
Enter given matrix 2:
1 2 3
4 5 6
7 8 9
Given matrix is:
2 4 6
8 10 12
14 16 18
```

2. Write a Java program to multiply two matrices.



```
10 /*
11  * 2. Write a Java program to multiply two matrices.
12  */
13 package matrix.com;
14
15 import java.util.Scanner;
16
17 public class MultiplyTwoMatrix {
18
19     public static void main(String[] args) {
20         // TODO Auto-generated method stub
21         Scanner sc = new Scanner(System.in);
22         System.out.println("Enter row and col: ");
23         int row=sc.nextInt();
24         int col=sc.nextInt();
25         int a[][]=new int[row][col];
26         int b[][]=new int[row][col];
27         int sum=0;
28         System.out.println("Enter given matrix 1: ");
29         for(int i=0;i<a.length;i++) {
30             for(int j=0;j<a[i].length;j++) {
31                 a[i][j]=sc.nextInt();
32             }
33         }
34         System.out.println("Enter given matrix 2: ");
35         for(int i=0;i<b.length;i++) {
36             for(int j=0;j<b[i].length;j++) {
37                 b[i][j]=sc.nextInt();
38             }
39         }
40         for(int i=0;i<b.length;i++) {
41             for(int j=0;j<b[i].length;j++) {
42                 a[i][j]=a[i][j]*b[i][j];
43             }
44         }
45         System.out.println("Given Multiplication of matrix is: ");
46         for(int i=0;i<a.length;i++) {
47             for(int j=0;j<a[i].length;j++) {
48                 System.out.print(a[i][j]+" ");
49             }
50             System.out.println();
51         }
52     }
53 }
```

```
<terminated> MultiplyTwoMatrix [Java Application] C:\Users\Shree\p2\pool\plugin\org.e
Enter row and col:
3 3
Enter given matrix 1:
1 2 3
4 5 6
7 8 9
Enter given matrix 2:
3 5 2
3 5 6
7 5 2
Given Multiplication of matrix is:
3 10 6
12 25 36
49 40 18
```

```
public static void main(String[] args) {
    // TODO Auto-generated method stub
    Scanner sc = new Scanner(System.in);
    System.out.println("Enter row and col: ");
    int row=sc.nextInt();
    int col=sc.nextInt();
    int a[][]=new int[row][col];
    int b[][]=new int[row][col];
    int sum=0;
    System.out.println("Enter given matrix 1: ");
    for(int i=0;i<a.length;i++) {
        for(int j=0;j<a[i].length;j++) {
            a[i][j]=sc.nextInt();
        }
    }
    System.out.println("Enter given matrix 2: ");
    for(int i=0;i<b.length;i++) {
        for(int j=0;j<b[i].length;j++) {
            b[i][j]=sc.nextInt();
        }
    }
    for(int i=0;i<b.length;i++) {
        for(int j=0;j<b[i].length;j++) {
            a[i][j]=a[i][j]*b[i][j];
        }
    }
    System.out.println("Given Multiplication of matrix is: ");
    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();
    }
}
```

```
<terminated> MultiplyTwoMatrix [Java Application] C:\Users\Shree\p2\pool\plugin\org.e
Enter row and col:
3 3
Enter given matrix 1:
1 2 3
4 5 6
7 8 9
Enter given matrix 2:
3 5 2
3 5 6
7 5 2
Given Multiplication of matrix is:
3 10 6
12 25 36
49 40 18
```

3. Write a Java program to find the transpose of a matrix.

```
1 package matrix.com;
2
3 import java.util.Scanner;
4
5 public class TransposeMatrix {
6
7     public static void main(String[] args) {
8         // TODO Auto-generated method stub
9         Scanner sc = new Scanner(System.in);
10        System.out.println("Enter row and col: ");
11        int row=sc.nextInt();
12        int col=sc.nextInt();
13        int a[][]=new int[row][col];
14        System.out.println("Enter given matrix 1: ");
15        for(int i=0;i<a.length;i++) {
16            for(int j=0;j<a[i].length;j++) {
17                a[i][j]=sc.nextInt();
18            }
19        }
20        System.out.println("Given transpose matrix is: ");
21        for(int i=0;i<a.length;i++) {
22            for(int j=0;j<a[i].length;j++) {
23                System.out.print(a[j][i]+" ");
24            }
25            System.out.println();
26        }
27    }
28 }
29
30
```

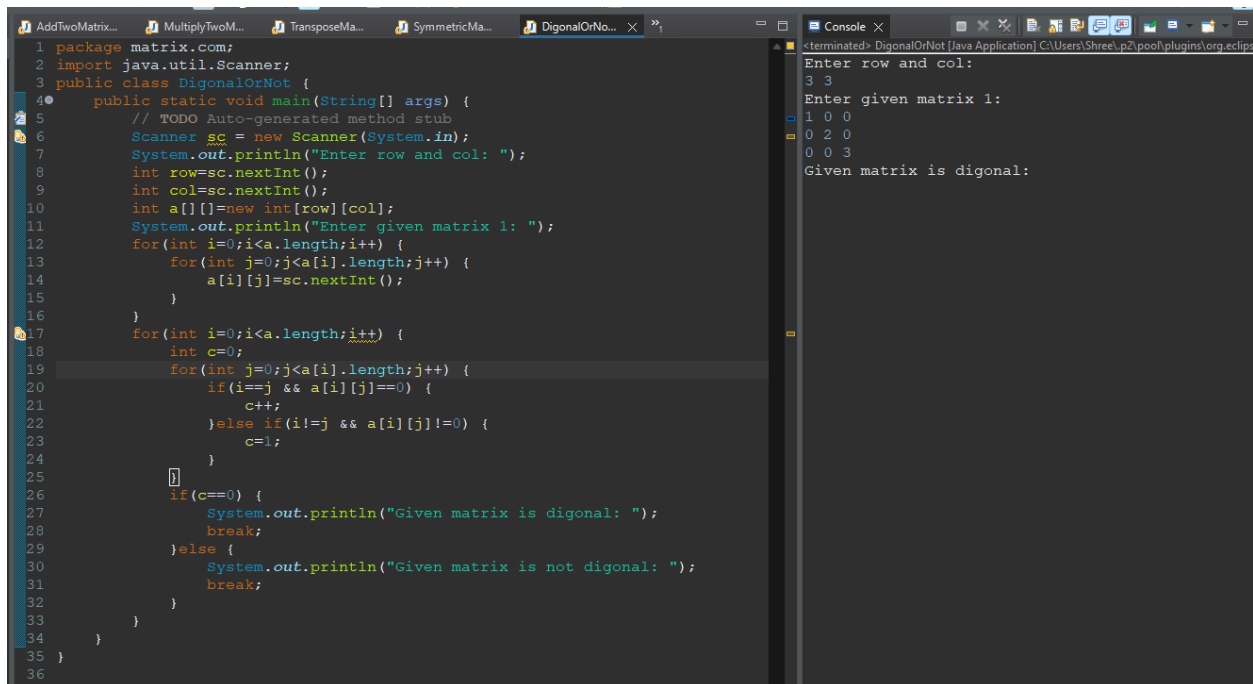
```
<terminated> TransposeMatrix [Java Application] C:\Users\Shree...
Enter row and col:
3 3
Enter given matrix 1:
1 2 3
4 5 6
7 8 9
Given transpose matrix is:
1 4 7
2 5 8
3 6 9
```

4. Write a Java program to check if a matrix is symmetric.

```
1 /*
2  * 4. Write a Java program to check if a matrix is symmetric.
3  */
4 package matrix.com;
5 import java.util.Scanner;
6 public class SymmetricMatrix {
7
8     public static void main(String[] args) {
9         // TODO Auto-generated method stub
10        Scanner sc = new Scanner(System.in);
11        System.out.println("Enter row and col: ");
12        int row=sc.nextInt();
13        int col=sc.nextInt();
14        int a[][]=new int[row][col];
15        System.out.println("Enter given matrix 1: ");
16        for(int i=0;i<a.length;i++) {
17            for(int j=0;j<a[i].length;j++) {
18                a[i][j]=sc.nextInt();
19            }
20        }
21        for(int i=0;i<a.length;i++) {
22            int c=0;
23            for(int j=0;j<a[i].length;j++) {
24                if(a[i][j]!=a[j][i]) {
25                    c++;
26                    break;
27                }
28            }
29            if(c==0) {
30                System.out.println("Symmetric");
31                break;
32            }else {
33                System.out.println("Not symmmetic");
34                break;
35            }
36        }
37    }
38 }
39
```

```
<terminated> SymmetricMatrix [Java Application] C:\Users\Shree...
Enter row and col:
3 3
Enter given matrix 1:
1 2 3
2 3 4
3 4 5
Symmetric
```

5. Write a Java program to check if a matrix is diagonal.

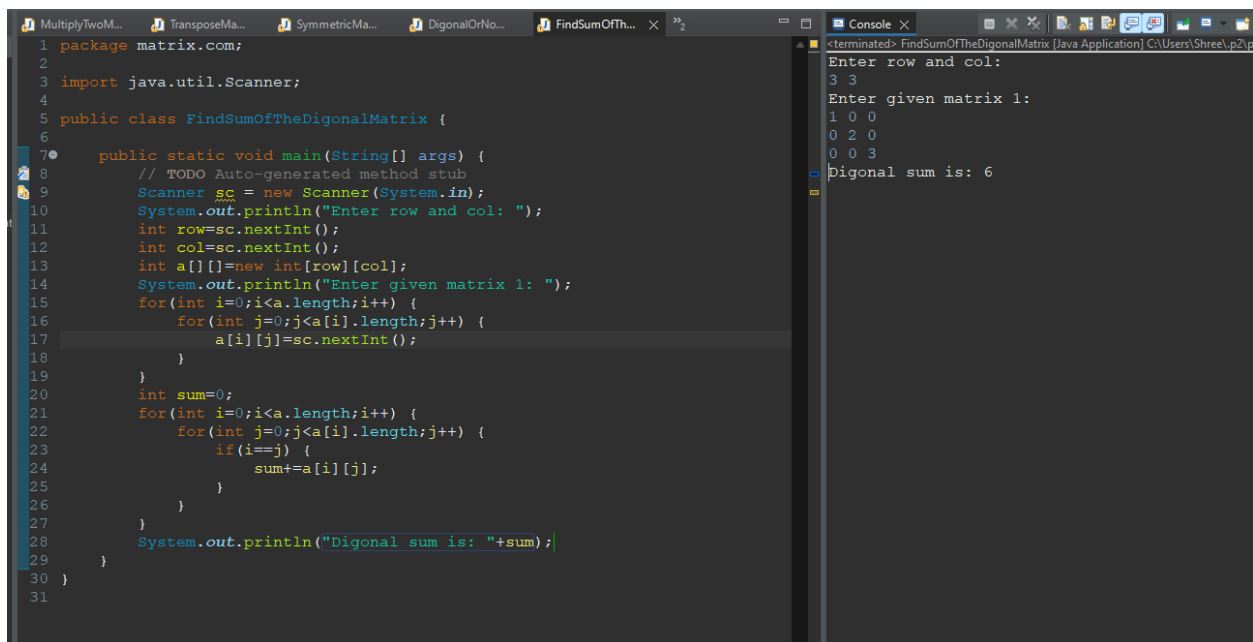


```
1 package matrix.com;
2 import java.util.Scanner;
3 public class DigonalOrNot {
4     public static void main(String[] args) {
5         // TODO Auto-generated method stub
6         Scanner sc = new Scanner(System.in);
7         System.out.println("Enter row and col: ");
8         int row=sc.nextInt();
9         int col=sc.nextInt();
10        int a[][]=new int[row][col];
11        System.out.println("Enter given matrix 1: ");
12        for(int i=0;i<a.length;i++) {
13            for(int j=0;j<a[i].length;j++) {
14                a[i][j]=sc.nextInt();
15            }
16        }
17        for(int i=0;i<a.length;i++) {
18            int c=0;
19            for(int j=0;j<a[i].length;j++) {
20                if(i==j && a[i][j]==0) {
21                    c++;
22                }else if(i!=j && a[i][j]!=0) {
23                    c=1;
24                }
25            }
26            if(c==0) {
27                System.out.println("Given matrix is digonal: ");
28                break;
29            }else {
30                System.out.println("Given matrix is not digonal: ");
31                break;
32            }
33        }
34    }
35 }
36
```

Console output:

```
<terminated> DigonalOrNot [Java Application] C:\Users\Shree\p2\pooof\plugins\org.eclipse
Enter row and col:
3 3
Enter given matrix 1:
1 0 0
0 2 0
0 0 3
Given matrix is digonal:
```

6. Write a Java program to find the sum of the diagonal elements of a matrix.



```
1 package matrix.com;
2
3 import java.util.Scanner;
4
5 public class FindSumOfTheDigonalMatrix {
6
7     public static void main(String[] args) {
8         // TODO Auto-generated method stub
9         Scanner sc = new Scanner(System.in);
10        System.out.println("Enter row and col: ");
11        int row=sc.nextInt();
12        int col=sc.nextInt();
13        int a[][]=new int[row][col];
14        System.out.println("Enter given matrix 1: ");
15        for(int i=0;i<a.length;i++) {
16            for(int j=0;j<a[i].length;j++) {
17                a[i][j]=sc.nextInt();
18            }
19        }
20        int sum=0;
21        for(int i=0;i<a.length;i++) {
22            for(int j=0;j<a[i].length;j++) {
23                if(i==j) {
24                    sum+=a[i][j];
25                }
26            }
27        }
28        System.out.println("Digonal sum is: "+sum);
29    }
30 }
31
```

Console output:

```
<terminated> FindSumOfTheDigonalMatrix [Java Application] C:\Users\Shree\p2\p
Enter row and col:
3 3
Enter given matrix 1:
1 0 0
0 2 0
0 0 3
Digonal sum is: 6
```

7. Write a Java program to find the product of diagonal elements of a matrix.

TransposeMa... SymmetricMa... DigonalOrNo... FindSumOfDi... FindTheProdi... × ×₃

```
1 package matrix.com;
2
3 import java.util.Scanner;
4
5 public class FindTheProductOfDigonalEle {
6
7     public static void main(String[] args) {
8         // TODO Auto-generated method stub
9         Scanner sc = new Scanner(System.in);
10        System.out.println("Enter row and col: ");
11        int row=sc.nextInt();
12        int col=sc.nextInt();
13        int a[][]=new int[row][col];
14        System.out.println("Enter given matrix 1: ");
15        for(int i=0;i<a.length;i++) {
16            for(int j=0;j<a[i].length;j++) {
17                a[i][j]=sc.nextInt();
18            }
19        }
20        int sum=1;
21        for(int i=0;i<a.length;i++) {
22            for(int j=0;j<a[i].length;j++) {
23                if(i==j) {
24                    sum*=a[i][j];
25                }
26            }
27        }
28        System.out.println("Digonal product is: "+sum);
29    }
30 }
```

<terminated> FindTheProductOfDigonalEle [Java Application] C:\Users\Shree\p2\p...

Enter row and col:
3 3
Enter given matrix 1:
1 0 0
0 2 0
0 0 3
Digonal product is: 6

8. Write a Java program to find the sum of each row and column of a matrix.

```
1 package matrix.com;
2 import java.util.Scanner;
3 public class FindTheSumOfEachRowAndColumn {
4
5     public static void main(String[] args) {
6         // TODO Auto-generated method stub
7         Scanner sc = new Scanner(System.in);
8         System.out.println("Enter row and col: ");
9         int row=sc.nextInt();
10        int col=sc.nextInt();
11        int a[][]=new int[row][col];
12        System.out.println("Enter given matrix 1: ");
13        for(int i=0;i<a.length;i++) {
14            for(int j=0;j<a[i].length;j++) {
15                a[i][j]=sc.nextInt();
16            }
17        }
18
19        System.out.println("Enter given row and coloumn sum is: ");
20        for(int i=0;i<a.length;i++) {
21            int sum=0;
22            for(int j=0;j<a[i].length;j++) {
23                System.out.print(a[i][j]+" ");
24                sum+=a[i][j];
25            }
26            System.out.print("-->"+sum);
27            System.out.println();
28        }
29        for(int i=0;i<a.length;i++) {
30            int sum1=0;
31            for(int j=0;j<a[i].length;j++) {
32                sum1+=a[j][i];
33            }
34            System.out.print(sum1+" ");
35        }
36    }
37 }
```

9. Write a Java program to find the maximum element in a matrix.

```
1 package matrix.com;
2
3 import java.util.Scanner;
4
5 public class FindTheMaximumEleOfMatrix {
6
7     public static void main(String[] args) {
8         // TODO Auto-generated method stub
9         Scanner sc = new Scanner(System.in);
10        System.out.println("Enter row and col: ");
11        int row=sc.nextInt();
12        int col=sc.nextInt();
13        int a[][]=new int[row][col];
14        System.out.println("Enter given matrix 1: ");
15        for(int i=0;i<a.length;i++) {
16            for(int j=0;j<a[i].length;j++) {
17                a[i][j]=sc.nextInt();
18            }
19        }
20        int max=0;
21        for(int i=0;i<a.length;i++) {
22            for(int j=0;j<a[i].length;j++) {
23                if(a[i][j]>max) {
24                    max=a[i][j];
25                }
26            }
27        }
28        System.out.println("Max Matrix element is: "+max);
29    }
30
31 }
32
```

Console

```
<terminated> FindTheMaximumEleOfMatrix [Java Application] C:\U
Enter row and col:
3 3
Enter given matrix 1:
1 2 3
4 5 6
7 8 9
Max Matrix element is: 9
```

10. Write a Java program to find the minimum element in a matrix.

```
1 package matrix.com;
2
3 import java.util.Scanner;
4
5 public class FindMinEle {
6
7     public static void main(String[] args) {
8         // TODO Auto-generated method stub
9         Scanner sc = new Scanner(System.in);
10        System.out.println("Enter row and col: ");
11        int row=sc.nextInt();
12        int col=sc.nextInt();
13        int a[][]=new int[row][col];
14        System.out.println("Enter given matrix 1: ");
15        for(int i=0;i<a.length;i++) {
16            for(int j=0;j<a[i].length;j++) {
17                a[i][j]=sc.nextInt();
18            }
19        }
20        int min=Integer.MAX_VALUE;
21        for(int i=0;i<a.length;i++) {
22            for(int j=0;j<a[i].length;j++) {
23                if(a[i][j]<min) {
24                    min=a[i][j];
25                }
26            }
27        }
28        System.out.println("Min Matrix element is: "+min);
29    }
30
31 }
32
```

Console

```
<terminated> FindMinEle [Java Application] C:\Users\Shree\p2\prof\plugins
Enter row and col:
3 3
Enter given matrix 1:
1 2 3
4 5 6
7 8 9
Min Matrix element is: 1
```

11. Write a Java program to sort the elements of each row of a matrix.

```
1 package matrix.com;
2 import java.util.Scanner;
3 public class SortEleOfEachRow {
4     public static void main(String[] args) {
5         // TODO Auto-generated method stub
6         Scanner sc = new Scanner(System.in);
7         System.out.println("Enter row and col: ");
8         int row=sc.nextInt();
9         int col=sc.nextInt();
10        int a[][]=new int[row][col];
11        System.out.println("Enter given matrix 1: ");
12        for(int i=0;i<a.length;i++) {
13            for(int j=0;j<a[i].length;j++) {
14                a[i][j]=sc.nextInt();
15            }
16        }
17        System.out.println("Sorted row is: ");
18        for(int i=0;i<a.length;i++) {
19            for(int j=0;j<a[i].length-1;j++) {
20                for(int k=j+1;k<a[i].length;k++) {
21                    if(a[i][j]>a[i][k]) {
22                        int temp=a[i][j];
23                        a[i][j]=a[i][k];
24                        a[i][k]=temp;
25                    }
26                }
27            }
28        }
29        for(int i=0;i<a.length;i++) {
30            for(int j=0;j<a[i].length;j++) {
31                System.out.print(a[i][j]+" ");
32            }
33            System.out.println();
34        }
35    }
36 }
```

```
<terminated> SortEleOfEachRow [Java Application] C:\Users\Shree...
Enter row and col:
3 3
Enter given matrix 1:
3 6 1
2 4 6
6 3 7
Sorted row is:
1 3 6
2 4 6
3 6 7
```

12. Write a Java program to find the saddle point of a matrix.

```
1 package matrix.com;
2 import java.util.Scanner;
3 public class SaddlePoint {
4     public static void main(String[] args) {
5         // TODO Auto-generated method stub
6         Scanner sc = new Scanner(System.in);
7         System.out.println("Enter row and col: ");
8         int row=sc.nextInt();
9         int col=sc.nextInt();
10        int a[][]=new int[row][col];
11        System.out.println("Enter given matrix 1: ");
12        for(int i=0;i<a.length;i++) {
13            for(int j=0;j<a[i].length;j++) {
14                a[i][j]=sc.nextInt();
15            }
16        }
17        int ind=-1;
18        for(int i=0;i<a.length;i++) {
19            int max=0,min=Integer.MAX_VALUE;
20            for(int k=0;k<a[i].length;k++) {
21                if(a[i][k]<min) {
22                    min=a[i][k];
23                    ind=k;
24                }
25            }
26            for(int j=0;j<a[i].length;j++) {
27                if(a[i][ind]>max) {
28                    max=a[i][ind];
29                }
30            }
31            if(min==max) {
32                System.out.println("Saddle point");
33                break;
34            } else {
35                System.out.println("Not");
36            }
37        }
38    }
39 }
```

```
<terminated> SaddlePoint [Java Application] C:\Users\Shree\p2\pool\plugins\org.eclipse.justi...
Enter row and col:
3 3
Enter given matrix 1:
1 2 3
4 5 6
7 8 9
Saddle point
```

13. Write a Java program to find the frequency of a given element in a matrix.

```
1 package matrix.com;
2
3 import java.util.Scanner;
4
5 public class FindFrequencyOfMatrix {
6
7     public static void main(String[] args) {
8         // TODO Auto-generated method stub
9         Scanner sc = new Scanner(System.in);
10        System.out.println("Enter row and col: ");
11        int row=sc.nextInt();
12        int col=sc.nextInt();
13        int a[][]=new int[row][col];
14        System.out.println("Enter given matrix 1: ");
15        for(int i=0;i<a.length;i++) {
16            for(int j=0;j<a[i].length;j++) {
17                a[i][j]=sc.nextInt();
18            }
19        }
20        System.out.println("Enter given element: ");
21        int x=sc.nextInt();
22        int c=0;
23        for(int i=0;i<a.length;i++) {
24            for(int j=0;j<a[i].length;j++) {
25                if(a[i][j]==x) {
26                    c++;
27                }
28            }
29        }
30        System.out.println("Frequency of given number is: "+c);
31    }
32 }
33 }
```

Console

```
<terminated> FindFrequencyOfMatrix [Java Application] C:\Users\Shree\p2
Enter row and col:
3 3
Enter given matrix 1:
1 2 3
3 3 4
5 6 7
Enter given element:
3
Frequency of given number is: 3
```

14. Write a Java program to rotate a matrix by 90 degrees clockwise.

```
1 package matrix.com;
2
3 import java.util.Scanner;
4
5 public class RotateMatrixClockWiseNintyDegree {
6
7     public static void main(String[] args) {
8         // TODO Auto-generated method stub
9         Scanner sc = new Scanner(System.in);
10        System.out.println("Enter row and col: ");
11        int row=sc.nextInt();
12        int col=sc.nextInt();
13        int a[][]=new int[row][col];
14        System.out.println("Enter given matrix 1: ");
15        for(int i=0;i<a.length;i++) {
16            for(int j=0;j<a[i].length;j++) {
17                a[i][j]=sc.nextInt();
18            }
19        }
20        System.out.println("Clock wise matrix: ");
21        for(int i=0;i<a.length;i++) {
22            for(int j=a.length-1;j>=0;j--) {
23                System.out.print(a[j][i]+" ");
24            }
25            System.out.println();
26        }
27    }
28 }
29 }
30 }
```

Console

```
<terminated> RotateMatrixClockWiseNintyDegree [Java App
Enter row and col:
3 3
Enter given matrix 1:
1 2 3
3 3 4
5 6 7
Clock wise matrix:
5 3 1
6 3 2
7 4 3
```

1: Implement a function to rotate a square matrix (2D array) by 90 degrees in clockwise direction.

Example:

Input:

[[1, 2, 3],

[4, 5, 6],

[7, 8, 9]]

Output:

[[7, 4, 1],

[8, 5, 2],

[9, 6, 3]]

The screenshot shows a Java IDE with a code editor on the left and a console on the right. The code in the editor is as follows:

```
1 package matrix.com;
2
3 import java.util.Scanner;
4
5 public class RotateMatrixClockWiseNintyDegree {
6
7     public static void main(String[] args) {
8         // TODO Auto-generated method stub
9         Scanner sc = new Scanner(System.in);
10        System.out.println("Enter row and col: ");
11        int row=sc.nextInt();
12        int col=sc.nextInt();
13        int a[][]=new int[row][col];
14        System.out.println("Enter given matrix 1: ");
15        for(int i=0;i<a.length;i++) {
16            for(int j=0;j<a[i].length;j++) {
17                a[i][j]=sc.nextInt();
18            }
19        }
20        System.out.println("Clock wise matrix: ");
21        for(int i=0;i<a.length;i++) {
22            for(int j=a.length-1;j>=0;j--) {
23                System.out.print(a[j][i]+" ");
24            }
25            System.out.println();
26        }
27    }
28 }
29
30
```

The console output on the right shows the program's execution:

```
<terminated> RotateMatrixClockWiseNintyDegree [Java Application] C:\Users\Shree\p2
Enter row and col:
3 3
Enter given matrix 1:
1 2 3
4 5 6
7 8 9
Clock wise matrix:
7 4 1
8 5 2
9 6 3
```

2: Given a matrix of integers, write a function to find the median of the matrix. The matrix is sorted in non-decreasing order both row-wise and column-wise.

Example:

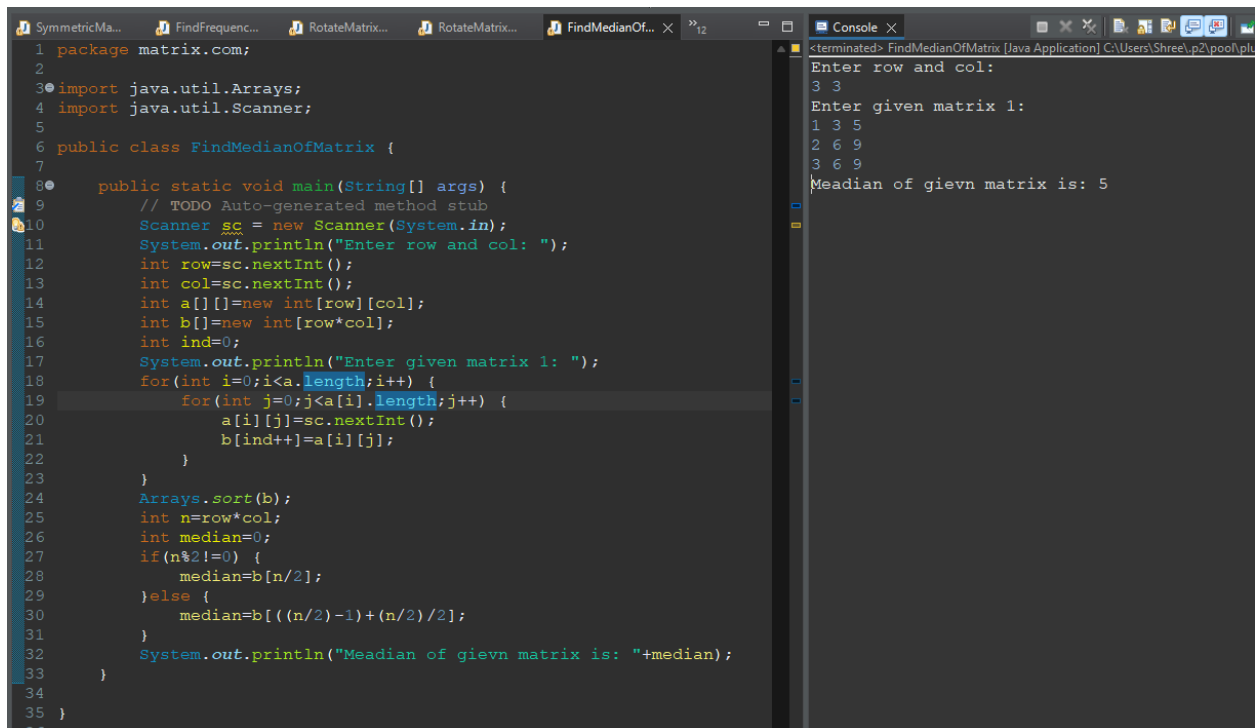
Input:

[1, 3, 5], n=9 m=

[2, 6, 9],

[3, 6, 9]

Output: 5



The screenshot shows a Java IDE with a code editor on the left and a console on the right. The code in the editor is as follows:

```
1 package matrix.com;
2
3 import java.util.Arrays;
4 import java.util.Scanner;
5
6 public class FindMedianOfMatrix {
7
8     public static void main(String[] args) {
9         // TODO Auto-generated method stub
10        Scanner sc = new Scanner(System.in);
11        System.out.println("Enter row and col: ");
12        int row=sc.nextInt();
13        int col=sc.nextInt();
14        int a[][]=new int[row][col];
15        int b[]=new int[row*col];
16        int ind=0;
17        System.out.println("Enter given matrix 1: ");
18        for(int i=0;i<a.length;i++) {
19            for(int j=0;j<a[i].length;j++) {
20                a[i][j]=sc.nextInt();
21                b[ind++]=a[i][j];
22            }
23        }
24        Arrays.sort(b);
25        int n=row*col;
26        int median=0;
27        if(n%2!=0) {
28            median=b[n/2];
29        }else {
30            median=b[((n/2)-1)+(n/2)/2];
31        }
32        System.out.println("Median of given matrix is: "+median);
33    }
34 }
35 }
```

The console on the right shows the following output:

```
<terminated> FindMedianOfMatrix [Java Application] C:\Users\Shree\p2\pool\plu
Enter row and col:
3 3
Enter given matrix 1:
1 3 5
2 6 9
3 6 9
Median of given matrix is: 5
```

3. Given a matrix of integers, write a function to find the kth smallest element in the matrix. The matrix is sorted in non-decreasing order both row-wise and column-wise.

Example:

Input:

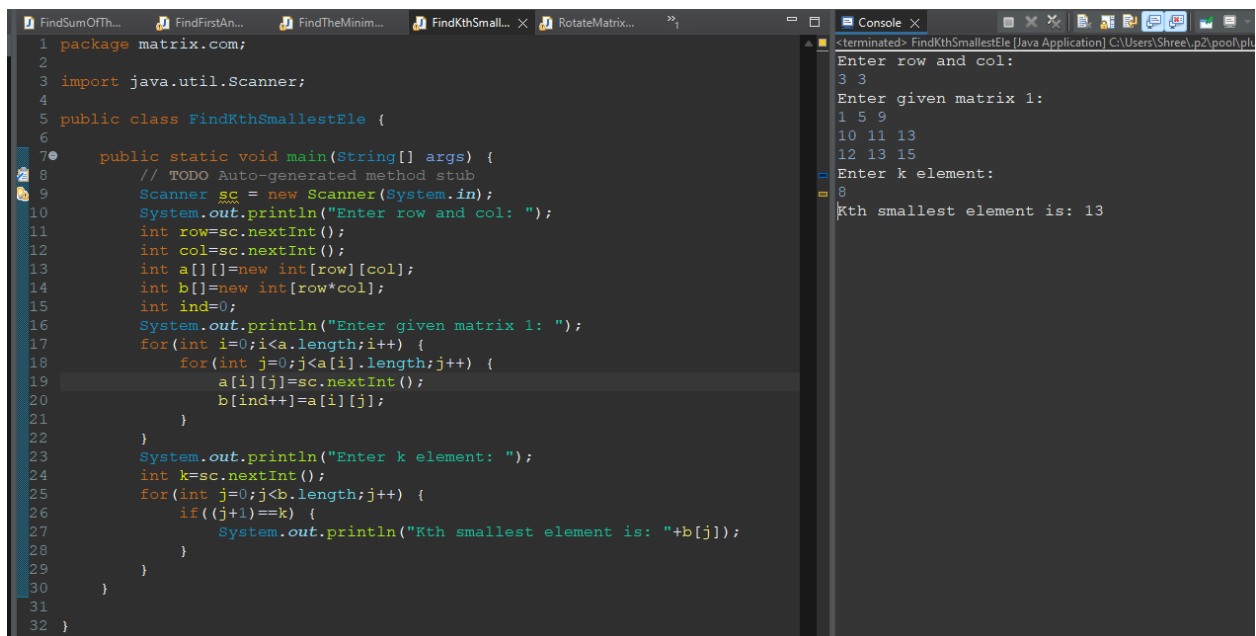
[[1, 5, 9],

[10, 11, 13],

[12, 13, 15]]

k = 8

Output: 13



```
1 package matrix.com;
2
3 import java.util.Scanner;
4
5 public class FindKthSmallestEle {
6
7     public static void main(String[] args) {
8         // TODO Auto-generated method stub
9         Scanner sc = new Scanner(System.in);
10        System.out.println("Enter row and col: ");
11        int row=sc.nextInt();
12        int col=sc.nextInt();
13        int a[][]=new int[row][col];
14        int b[]=new int[row*col];
15        int ind=0;
16        System.out.println("Enter given matrix 1: ");
17        for(int i=0;i<a.length;i++) {
18            for(int j=0;j<a[i].length;j++) {
19                a[i][j]=sc.nextInt();
20                b[ind++]=a[i][j];
21            }
22        }
23        System.out.println("Enter k element: ");
24        int k=sc.nextInt();
25        for(int j=0;j<b.length;j++) {
26            if((j+1)==k) {
27                System.out.println("Kth smallest element is: "+b[j]);
28            }
29        }
30    }
31 }
32 }
```

Console Output:

```
<terminated> FindKthSmallestEle [Java Application] C:\Users\Shree\p2\pool\pl
Enter row and col:
3 3
Enter given matrix 1:
1 5 9
10 11 13
12 13 15
Enter k element:
8
Kth smallest element is: 13
```

4. Given a matrix of integers, write a function to rotate it counter-clockwise by 90 degrees.

Example:

Input:

[[1, 2, 3],

[4, 5, 6],

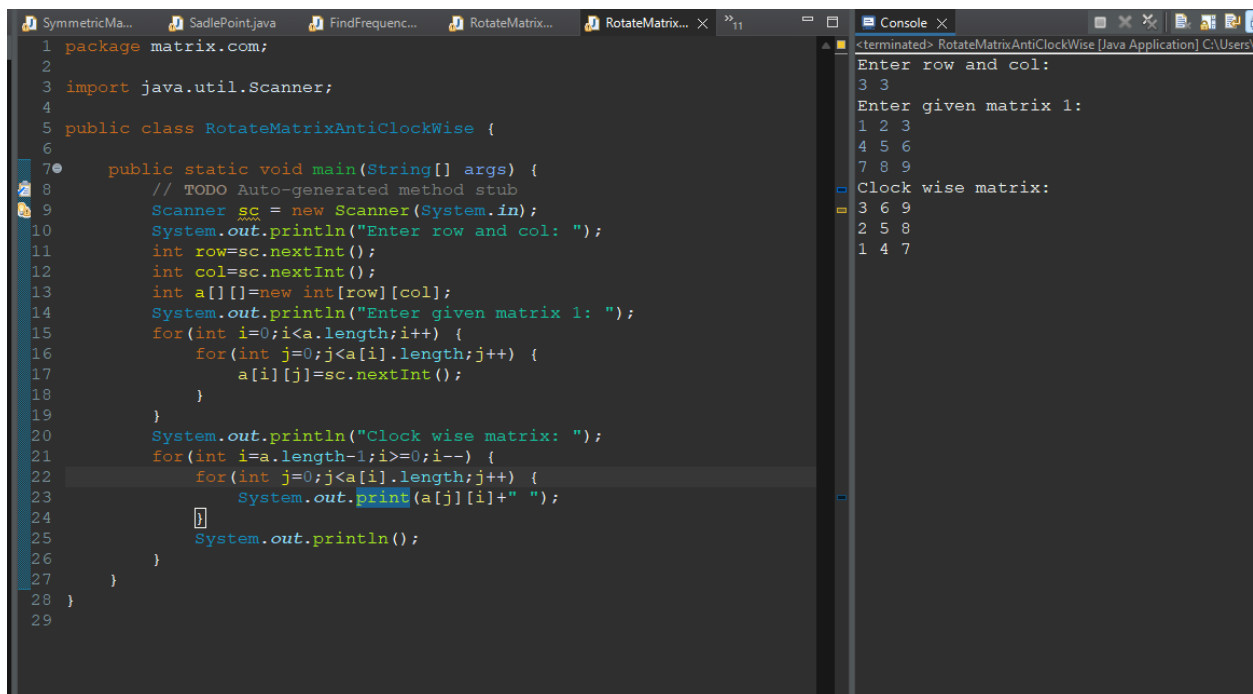
[7, 8, 9]]

Output:

[[3, 6, 9],

[2, 5, 8],

[1, 4, 7]]



The screenshot shows a Java IDE with a code editor on the left and a console on the right. The code editor displays the following Java code:

```
1 package matrix.com;
2
3 import java.util.Scanner;
4
5 public class RotateMatrixAntiClockWise {
6
7     public static void main(String[] args) {
8         // TODO Auto-generated method stub
9         Scanner sc = new Scanner(System.in);
10        System.out.println("Enter row and col: ");
11        int row=sc.nextInt();
12        int col=sc.nextInt();
13        int a[][]=new int[row][col];
14        System.out.println("Enter given matrix 1: ");
15        for(int i=0;i<a.length;i++) {
16            for(int j=0;j<a[i].length;j++) {
17                a[i][j]=sc.nextInt();
18            }
19        }
20        System.out.println("Clock wise matrix: ");
21        for(int i=a.length-1;i>=0;i--) {
22            for(int j=0;j<a[i].length;j++) {
23                System.out.print(a[j][i]+" ");
24            }
25            System.out.println();
26        }
27    }
28 }
29
```

The console on the right shows the program's execution:

```
<terminated> RotateMatrixAntiClockWise [Java Application] C:\Users\
Enter row and col:
3 3
Enter given matrix 1:
1 2 3
4 5 6
7 8 9
Clock wise matrix:
3 6 9
2 5 8
1 4 7
```