1) Take m and n input from user and m * n integers inputs from user and print the following:

a) Numbers of positive number

b) Numbers of negative number

c) Numbers of odd number

d) Numbers of even number

e) Numbers of 0 number

Ans:

```
import java.util.Scanner;

public class NumberStatistics {
    public static void main(String[] args) {
        Scanner scanner = new Scanner(System.in);

        System.out.print("Enter the value of m: ");
        int m = scanner.nextInt();

        System.out.print("Enter the value of n: ");
        int n = scanner.nextInt();

        int positiveCount = 0;
        int negativeCount = 0;
        int oddCount = 0;
        int evenCount = 0;
        int zeroCount = 0;

        System.out.println("Enter " + (m * n) + " integers:");

        for (int i = 0; i < m * n; i++) {
            int num = scanner.nextInt();
```

```
            if (num > 0) {
                positiveCount++;
            } else if (num < 0) {
                negativeCount++;
            }

            if (num % 2 == 0) {
                evenCount++;
            } else {
                oddCount++;
            }

            if (num == 0) {
                zeroCount++;
            }
        }

        System.out.println("Number of positive numbers: " + positiveCount);
        System.out.println("Number of negative numbers: " + negativeCount);
        System.out.println("Number of odd numbers: " + oddCount);
        System.out.println("Number of even numbers: " + evenCount);
        System.out.println("Number of zero numbers: " + zeroCount);

        scanner.close();
    }
}
```

2) write a program to print the elements above the secondary diagonal in a user inputted square matrix.

Ans:

```
import java.util.Scanner;

public class AboveSecondaryDiagonal {
    public static void main(String[] args) {
        Scanner scanner = new Scanner(System.in);

        System.out.print("Enter the size of the square matrix: ");
        int size = scanner.nextInt();

        int[][] matrix = new int[size][size];
```

```
        System.out.println("Enter the elements of the square matrix:");

        for (int i = 0; i < size; i++) {
            for (int j = 0; j < size; j++) {
                matrix[i][j] = scanner.nextInt();
            }
        }

        System.out.println("Elements above the secondary diagonal:");

       for(int i = 0; i <matrix.length; i++){
            for(int j =0; j < matrix[0].length; j++){
                if( i + j < matrix.length-1){
                    System.out.print(matrix[i][j] + " ");
                }
            }
        }


        scanner.close();
    }
}
```

3) Write a program to print the elements of both the diagonals in a user inputted square matrix in any order.

Ans:

```
import java.util.Scanner;

public class BothDiagonalsSquareMatrix {
    public static void main(String[] args) {
        Scanner scanner = new Scanner(System.in);

        System.out.print("Enter the size of the square matrix: ");
        int size = scanner.nextInt();

        int[][] matrix = new int[size][size];

        System.out.println("Enter the elements of the square matrix:");
```

```
        for (int i = 0; i < size; i++) {
            for (int j = 0; j < size; j++) {
                matrix[i][j] = scanner.nextInt();
            }
        }

        System.out.println("Elements of the main diagonal:");

        for (int i = 0; i < size; i++) {
            System.out.print(matrix[i][i] + " ");
        }

        System.out.println("\nElements of the secondary diagonal:");

        for (int i = 0; i < size; i++) {
            System.out.print(matrix[i][size - 1 - i] + " ");
        }

        scanner.close();
    }
}
```

4) Write a program to find the largest element of a given 2D array of integers.

Ans:

```
public class LargestElement2DArray {
    public static void main(String[] args) {
        int[][] array = {
            {1, 5, 9},
            {3, 8, 12},
            {7, 2, 6}
        };

        int largest = findLargestElement(array);

        System.out.println("The largest element in the 2D array is: " + largest);
    }

    public static int findLargestElement(int[][] arr) {
        int largest = arr[0][0];
```

```
        for (int row = 0; row < arr.length; row++) {
            for (int col = 0; col < arr[row].length; col++) {
                if (arr[row][col] > largest) {
                    largest = arr[row][col];
                }
            }
        }

        return largest;
    }
}
```

5) Write a function which accepts a 2D array of Integers and its size as arguments and displays the element of middle row and element of middle column.Printing can be done in any order.(Assume the 2D array to be a square matrix with odd dimensions i.e 3x3 , 5x5, 7x7 etc.

Ans:

```
public class MiddleRowAndColumn {
    public static void main(String[] args) {
        int[][] array = {
            {1, 2, 3},
            {4, 5, 6},
            {7, 8, 9}
        };

        printMiddleElements(array);
    }

    public static void printMiddleElements(int[][] arr) {
        int size = arr.length;
        int middleIndex = size / 2;

        // Print middle row elements
        System.out.print("Middle Row Elements: ");
        for (int col = 0; col < size; col++) {
            System.out.print(arr[middleIndex][col] + " ");
        }
        System.out.println();
```

```
        // Print middle column elements
        System.out.print("Middle Column Elements: ");
        for (int row = 0; row < size; row++) {
            System.out.print(arr[row][middleIndex] + " ");
        }
        System.out.println();
    }
}
```