Q1: Take m and n input from the user and m * n integer inputs from user and print the following:
number of positive numbers
number of negative numbers
number of odd numbers
number of even numbers
number of 0.

CODE:-

```
import java.util.*;
public class CountDifferentNumbers {
    public static void main(String[] args) {
        Scanner sc=new Scanner(System.in);
        System.out.print("Enter the number of rows of array : ");
        int m=sc.nextInt();
        System.out.println();
        System.out.print("Enter number of columns of array : ");
        int n=sc.nextInt();
        System.out.println();
        int arr[][]=new int[m][n];
        for(int i=0;i<m;i++){
            for(int j=0;j<n;j++){
                arr[i][j]=sc.nextInt();
            }
        }
                                                                    int
no_of_pos=0,no_of_neg=0,no_of_eves=0,no_of_odds=0,no_of_zeros=0;
        for(int i=0;i<m;i++){
            for(int j=0;j<n;j++){
                if(arr[i][j]%2==0){
                    no_of_eves++;
                    if(arr[i][j]>0){
                        no_of_pos++;
                    }
                    else if(arr[i][j]<0){
                        no_of_neg++;
                    }
                    else{
                        no_of_zeros++;
                    }
                }
```

```
                else{
                    no_of_odds++;
                    if(arr[i][j]>0){
                        no_of_pos++;
                    }
                    else if(arr[i][j]<0){
                        no_of_neg++;
                    }
                    else{
                        no_of_zeros++;
                    }
                }
            }
        }
        System.out.println("number of positive numbers :"+no_of_pos);
        System.out.println("number of negative numbers :"+no_of_neg);
        System.out.println("number of odd numbers : "+no_of_odds);
        System.out.println("number of even numbers : "+no_of_eves);
        System.out.println("number of zeros : "+no_of_zeros);
    }
}
```

OUTPUT:-

Enter the number of rows of array : 4

Enter number of columns of array : 4

1 2 -3 4
0 0 -4 2
1 -1 2 3
-4 -5 -7 0

number of positive numbers :7
number of negative numbers :6
number of odd numbers : 7
number of even numbers : 9
number of zeros : 3

Q2: write a program to print the elements above the secondary diagonal in a user inputted square matrix.

CODE:-

```
import java.util.*;
public class AboveSecondaryDiag {
    public static void main(String[] args) {
        Scanner sc=new Scanner(System.in);
        System.out.print("Enter number of rows : ");
        int m=sc.nextInt();
        System.out.println();
        System.out.print("Enter number of columns : ");
        int n=sc.nextInt();
        System.out.println();
        int [][]arr=new int[m][n];
        System.out.println("Enter the array elements : ");
        for(int i=0;i<n;i++){
            for(int j=0;j<m;j++){
                arr[i][j]=sc.nextInt();
            }
        }
        int q1=m/2;
        int q2=n/2;
        System.out.println("Above elements to secondary diagonal : ");

        for(int i=0;i<n-1;i++){
            for(int j=0;j<m-1;j++){
                if(i==q1 && j==q2){
                    break;
                }
                else{
                        System.out.print("Above elements to secondary
diagonal "+arr[i][j]+" ");
                }

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

```
    }
}
```

OUTPUT:-

Enter number of rows : 3

Enter number of columns : 3

Enter the array elements :
1 2 3
4 5 6
7 8 9
Above elements to secondary diagonal :
1 2 4

Q3: write a program to print the elements of both the diagonals in a user inputted square matrix in any order.

CODE:-

```
import java.util.*;
public class ElementsOnDiag {
    public static void main(String[] args) {
        Scanner sc=new Scanner(System.in);
        System.out.print("Enter the size of the square matrix : ");
        System.out.println();
        int n=sc.nextInt();
        int [][]arr=new int[n][n];
        System.out.println("Enter the array elements : ");
        for(int i=0;i<n;i++){
            for(int j=0;j<n;j++){
                arr[i][j]=sc.nextInt();
            }
        }
        for(int j=0;j<n;j++){
            System.out.print(arr[j][j]+" ");
        }
        for(int h=0;h<n;h++){
            if(h==(n-h-1)){
```

```
                continue;
            }
            else{
            System.out.print(arr[h][n-h-1]+" ");
            }
        }
    }
}
```

OUTPUT:-

Enter the size of the square matrix :
3
Enter the array elements :
1 2 3
4 5 6
7 8 9

1 5 9 3 7

Q4: Write a program to find the largest element of a given 2D array of integers.

CODE:-

```
import java.util.Scanner;
class LargestIn2D{
    public static void main(String[] args) {
        Scanner sc=new Scanner(System.in);
        System.out.print("Enter the number of rows of the array : ");
        int m=sc.nextInt();
        System.out.println();
        System.out.print("Enter the number of columns of array : ");
        int n=sc.nextInt();
        System.out.println();
        int [][]arr=new int[m][n];
        System.out.println("enter the array elements : ");
        for(int i=0;i<m;i++){
            for(int j=0;j<n;j++){
```

```
                arr[i][j]=sc.nextInt();
            }
        }
        int max=0;
        for(int i=0;i<m;i++){
            for(int j=0;j<n;j++){
                if(arr[i][j]>max){
                    max=arr[i][j];
                }
            }
        }
        System.out.println("largest element is : "+max);
    }
}
```

OUTPUT:-

Enter the number of rows of the array : 4

Enter the number of columns of array : 3

enter the array elements :
1 2 3
4 5 6
7 8 9
12 47 98
largest element is : 98

Q5: Write a function which accepts a 2D array of integers and its size as arguments and displays the elements of middle row and the elements of middle column. Printing can be done in any order.
[Assuming the 2D Array to be a square matrix with odd dimensions i.e. 3x3, 5x5, 7x7 etc...]

CODE:-

```
import java.util.Scanner;
public class MiddleElements {
    public static void main(String[] args) {
        Scanner sc=new Scanner(System.in);
        System.out.print("Enter the number of rows of the array : ");
```

```
        int m=sc.nextInt();
        System.out.println();
        System.out.print("Enter the number of columns of array : ");
        int n=sc.nextInt();
        System.out.println();
        int [][]arr=new int[m][n];
        System.out.println("enter the array elements : ");
        for(int i=0;i<m;i++){
            for(int j=0;j<n;j++){
                arr[i][j]=sc.nextInt();
            }
        }

        int q1=m/2;
        int q2=n/2;
        System.out.println("middle indexes elements are :");
        for(int i=0;i<m;i++){
            for(int j=0;j<n;j++){
                if(i==q1 || j==q2){
                    System.out.print(arr[i][j]+" ");
                }
            }
        }
        System.out.println();

    }
}
```

OUTPUT:-

Enter the number of rows of the array : 3

Enter the number of columns of array : 3

enter the array elements :
5 4 7
5 9 8
4 89 3
middle indexes elements are :
4 5 9 8 89