ASSIGNMENT- (2D ARRAY)

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.

Ans-
```java
import java.util.Scanner;


public class Array2D_Assg1 {

    static void findAns(int[][] arr, int m, int n) {
        int pi = 0, ni = 0, on = 0, en = 0, zero = 0;
        for (int i = 0; i < m; i++) {
            for (int j = 0; j < n; j++) {
                if (arr[i][j] > 0) {
                    pi++;
                }
                if (arr[i][j] < 0) {
                    ni++;
                }
                if (arr[i][j] == 0) {
                    zero++;
                }
                if (arr[i][j] % 2 == 0) {
                    en++;
                }
                if (arr[i][j] % 2 != 0) {
                    on++;
                }
            }
        }
        System.out.println("number of positive numbers= " + pi);
        System.out.println("number of negative numbers= " + ni);
        System.out.println("number of odd numbers= " + on);
        System.out.println("number of even numbers= " + en);
        System.out.println("number of 0= " + zero);
    }

    public static void main(String[] args) {
        Scanner sc = new Scanner(System.in);
        System.out.print("Enter the no. of rows: ");
```

```
        int m = sc.nextInt();
        System.out.print("Enter the no. of columns: ");
        int n = sc.nextInt();
        int[][] arr = new int[m][n];
        System.out.println("Enter elements of matrix:");
        for (int i = 0; i < m; i++) {
            for (int j = 0; j < n; j++) {
                arr[i][j] = sc.nextInt();
            }
        }
        findAns(arr, m, n);
    }
}
```

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

Ans-
```
import java.util.*;


public class Array2D_Assg2 {

    static void printAbove(int[][] arr, int m, int n) {
        for (int i = 0; i < m; i++) {
            for (int j = 0; j < m; j++) {
                if ((i + j) < (n - 1)) {
                    System.out.print(arr[i][j] + " ");
                }
            }
        }
    }

    public static void main(String[] args) {
        Scanner sc = new Scanner(System.in);
        System.out.print("Enter the no. of rows: ");
        int m = sc.nextInt();
        System.out.print("Enter the no. of columns: ");
        int n = sc.nextInt();
        int[][] arr = new int[m][n];
        System.out.println("Enter elements of matrix:");
        for (int i = 0; i < m; i++) {
            for (int j = 0; j < n; j++) {
                arr[i][j] = sc.nextInt();
            }
        }
        printAbove(arr, m, n);
    }
}
```

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

Ans-
```java
import java.util.*;


public class Array2D_Assg3 {

    static void printDiagonals(int[][] arr, int m, int n) {
        for (int i = 0; i < m; i++) {
            for (int j = 0; j < n; j++) {
                if (i == j || (i + j) == (n - 1)) {
                    System.out.print(arr[i][j] + " ");
                }
            }
        }
    }

    public static void main(String[] args) {
        Scanner sc = new Scanner(System.in);
        System.out.print("Enter the no. of rows: ");
        int m = sc.nextInt();
        System.out.print("Enter the no. of columns: ");
        int n = sc.nextInt();
        int[][] arr = new int[m][n];
        System.out.println("Enter elements of matrix:");
        for (int i = 0; i < m; i++) {
            for (int j = 0; j < n; j++) {
                arr[i][j] = sc.nextInt();
            }
        }
        printDiagonals(arr, m, n);
    }
}
```

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

Ans-
```java
import java.util.*;


public class Array2D_Assg4 {

    static int findMax(int[][] arr, int m, int n) {
        int max = arr[0][0];
        for (int i = 0; i < m; i++) {
            for (int j = 0; j < n; j++) {
                if (arr[i][j] > max) {
                    max = arr[i][j];
                }
```

```
            }
        }
        return max;
    }

    public static void main(String[] args) {
        Scanner sc = new Scanner(System.in);
        System.out.print("Enter the no. of rows: ");
        int m = sc.nextInt();
        System.out.print("Enter the no. of columns: ");
        int n = sc.nextInt();
        int[][] arr = new int[m][n];
        System.out.println("Enter elements of matrix:");
        for (int i = 0; i < m; i++) {
            for (int j = 0; j < n; j++) {
                arr[i][j] = sc.nextInt();
            }
        }
        int max = findMax(arr, m, n);
        System.out.println("Largest element in a given 2D Array is: " + max);
    }
}
```

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...]

Ans-
```
import java.util.*;


public class Array2D_Assg5 {

    static void printRC(int[][] arr, int n) {
        for (int i = 0; i < n; i++) {
            for (int j = 0; j < n; j++) {
                if (i == n / 2 || j == n / 2) {
                    System.out.print(arr[i][j] + " ");
                }
            }
        }
    }

    public static void main(String[] args) {
        Scanner sc = new Scanner(System.in);
        System.out.print("Enter the no. of rows & columns: ");
        int n = sc.nextInt();
        int[][] arr = new int[n][n];
        System.out.println("Enter elements of matrix:");
```

```
        for (int i = 0; i < n; i++) {
            for (int j = 0; j < n; j++) {
                arr[i][j] = sc.nextInt();
            }
        }
        printRC(arr, n);
    }
}
```