2D Arrays Assignment

Assignment

Questions

Assignment Questions

1. 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.*;
public class OperationOnTwoDArray {
    public static void main(String[]args){
        int positive = 0;
        int zero = 0;
        int negative = 0;
        int even = 0;
        int odd = 0;
        Scanner sc = new Scanner (System.in);
        System.out.println("Enter the number of rows present in 2D array ");
        int m = sc.nextInt();
        System.out.println("Enter the number of columns present in 2D array ");
        int n = sc.nextInt();

        int ar[][] = new int[m][n];
        for (int i = 0 ; i<m ; i++){
            for (int j =0 ; j<n ; j++){
                System.out.println("Enter the number present at index " + "(" +
i + "," + j + ")");
                ar[i][j] =  sc.nextInt();
            }
```

```java
        }

        for(int i = 0 ; i<m ; i++){
            for (int j=0 ; j<n ; j++){
                if (ar[i][j] % 2 ==0){
                    even++;
                }
                else{
                    odd++;
                }

                if (ar[i][j] > 0){
                    positive++;
                }
                else if (ar[i][j]==0){

                    zero++;
                }
                else{
                    negative++;
                }
            }
        }

        System.out.println("Number of positive numbers = " + positive);
        System.out.println("Number of negative numbers = " + negative);
        System.out.println("Number of odd numbers = " + odd);
        System.out.println("Number of even numbers = " + even);
        System.out.println("Number of 0 = " + zero);


    }
}
```

Output :-

Enter the number of rows present in 2D array
4
Enter the number of columns present in 2D array
4
Enter the number present at index (0,0)
1
Enter the number present at index (0,1)
2

Enter the number present at index (0,2)
-3
Enter the number present at index (0,3)
4
Enter the number present at index (1,0)
0
Enter the number present at index (1,1)
0
Enter the number present at index (1,2)
-4
Enter the number present at index (1,3)
2
Enter the number present at index (2,0)
1
Enter the number present at index (2,1)
-1
Enter the number present at index (2,2)
2
Enter the number present at index (2,3)
3
Enter the number present at index (3,0)
-4
Enter the number present at index (3,1)
-5
Enter the number present at index (3,2)
-7
Enter the number present at index (3,3)
0
Number of positive numbers = 7
Number of negative numbers = 6
Number of odd numbers = 7
Number of even numbers = 9
Number of 0 = 3

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

Ans :

```java
import java.util.*;
public class ElementsAboveSecondaryDiagonal {
    public static void main(String[]args){
        Scanner sc = new Scanner (System.in);
        System.out.println("Enter the size of square matrix");
        int n = sc.nextInt();
```

```java
        int ar[][] = new int [n][n];
        for (int i = 0 ; i<n ; i++){
            for (int j = 0 ; j<n ; j++){
                System.out.println("Enter the number present at index (" + i +
"," + j + ")");
                ar[i][j] = sc.nextInt();
            }
        }

        System.out.println("The element above the secondary diagonal are : ");

        for(int i = 0 ; i<n ; i++){
            for(int j = 0 ; j<n ; j++){
                if (i+j < n-1){
                    System.out.print(ar[i][j] + " ");
                }
            }
        }
        System.out.println();
    }
}
```

Output :-

Enter the size of square matrix
3
Enter the number present at index (0,0)
1
Enter the number present at index (0,1)
2
Enter the number present at index (0,2)
3
Enter the number present at index (1,0)
4
Enter the number present at index (1,1)
5
Enter the number present at index (1,2)
6
Enter the number present at index (2,0)
7
Enter the number present at index (2,1)
8
Enter the number present at index (2,2)

9
The element above the secondary diagonal are :
1 2 4

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.*;
public class BothDiagonalElement {
    public static void main(String []args){
        Scanner sc = new Scanner (System.in);
        System.out.println("Enter the size of the Square matrix");
        int n = sc.nextInt();

        int ar[][] = new int [n][n];

        for (int i = 0 ; i<n ; i++){
            for (int j = 0 ; j<n ; j++){
                System.out.println("Enter the number present at index (" + i +
"," + j + ")");
                ar[i][j] = sc.nextInt();
            }
        }

        System.out.println("The elements present at both the diagonals : ");

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

        System.out.println();

    }
}
```

Output :-

Enter the size of the Square matrix
3
Enter the number present at index (0,0)
1
Enter the number present at index (0,1)
2
Enter the number present at index (0,2)
3
Enter the number present at index (1,0)
4
Enter the number present at index (1,1)
5
Enter the number present at index (1,2)
6
Enter the number present at index (2,0)
7
Enter the number present at index (2,1)
8
Enter the number present at index (2,2)
9
The elements present at both the diagonals :
1 3 5 7 9

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

Ans :

```java
import java.util.*;
public class LargestElementOfTwoDArray {
    public static void main(String[]args){
        int r = 0;
        Scanner sc = new Scanner (System.in);
        System.out.println("Enter the number of rows present in the 2D array");
        int m = sc.nextInt();
        System.out.println("Enter the number of column present in the 2D
array");
        int n = sc.nextInt();

        int ar [][] = new int [m][n];

        for (int i = 0 ; i<m ; i++){
            for(int j = 0 ; j<n ; j++){
                System.out.println("Enter the number present at index (" + i +
```

```java
"," + j + ")");
                ar[i][j] = sc.nextInt();
            }
        }

        for(int i = 0 ; i<m ; i++){
            for (int j = 0 ; j<n ; j++){
                int p = ar[i][j];
                for (int k = 0 ; k<m ; k++){
                    for (int l = 0 ; l<n ; l++){
                        if (ar[i][j] >= ar[k][l]){
                            r++;
                        }
                    }
                }
                if(r==m*n){
                    System.out.println("The largest element present in this 2D
array is : " + ar[i][j]);
                }
                else{
                    r=0;
                }
            }
        }
    }
}
```

Output :-

Enter the number of rows present in the 2D array
3
Enter the number of column present in the 2D array
4
Enter the number present at index (0,0)
1
Enter the number present at index (0,1)
2
Enter the number present at index (0,2)
4
Enter the number present at index (0,3)
0
Enter the number present at index (1,0)
2

Enter the number present at index (1,1)
5
Enter the number present at index (1,2)
7
Enter the number present at index (1,3)
-1
Enter the number present at index (2,0)
4
Enter the number present at index (2,1)
2
Enter the number present at index (2,2)
6
Enter the number present at index (2,3)
9
The largest element present in this 2D array is : 9

5. 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 :

```java
import java.util.*;
public class MiddleRowAndColumnElement{
    public static void main(String[]args){
        Scanner sc = new Scanner (System.in);
        System.out.println("Enter the size of square matrix in odd
dimensions");
        int n = sc.nextInt();

        int mid = n/2;
        int ar[][] = new int [n][n];

        for(int i = 0 ; i<n ; i++){
            for(int j = 0 ; j<n ; j++){
                System.out.println("Enter the number present at the index (" +
i + "," + j + ")");
                ar[i][j] = sc.nextInt();
            }
        }

        System.out.println("The elements present at the middle row and the
```

```
middle column are");
        for(int i = 0 ; i<n ; i++){
            for (int j = 0 ; j<n ; j++){
                if(i == mid || j == mid){
                    System.out.print(ar[i][j] + " ");
                }
            }
        }
        System.out.println();
    }
}
```

Output :-

Enter the size of square matrix in odd dimensions
5
Enter the number present at the index (0,0)
1
Enter the number present at the index (0,1)
2
Enter the number present at the index (0,2)
3
Enter the number present at the index (0,3)
4
Enter the number present at the index (0,4)
5
Enter the number present at the index (1,0)
3
Enter the number present at the index (1,1)
4
Enter the number present at the index (1,2)
5
Enter the number present at the index (1,3)
6
Enter the number present at the index (1,4)
7
Enter the number present at the index (2,0)
7
Enter the number present at the index (2,1)
6
Enter the number present at the index (2,2)
5
Enter the number present at the index (2,3)
4
Enter the number present at the index (2,4)

3

Enter the number present at the index (3,0)

8

Enter the number present at the index (3,1)

7

Enter the number present at the index (3,2)

6

Enter the number present at the index (3,3)

5

Enter the number present at the index (3,4)

4

Enter the number present at the index (4,0)

1

Enter the number present at the index (4,1)

2

Enter the number present at the index (4,2)

37

Enter the number present at the index (4,3)

8

Enter the number present at the index (4,4)

0

The elements present at the middle row and the middle column are

3 5 7 6 5 4 3 6 37