```
[[[1]]] //Sum of columns

import java.util.Scanner;
public class Task1 {
        public static void main(String[] args) {

                Scanner input = new Scanner (System.in);
                System.out.print("Enter row and column : ");
                int row = input.nextInt();
                int col = input.nextInt();
                double [][] arr = new double [row][col];

                System.out.print("Enter elements : ");
                for(int i = 0 ; i < row ; i++) {
                        for(int j = 0 ; j < col ; j++) {
                                arr[i][j] = input.nextDouble();
                        }
                }
                System.out.println("Sum of columns :  ");
                for(int column = 0 ; column < arr[0].length ; column++) {
                        System.out.println("Sum of elements of column " + (column+1)
+ " is " +sumColumn(arr,column));
                }
        }
        public static double sumColumn(double[][] m, int columnIndex) {
                double sum = 0 ;
                for(int row = 0 ; row < m.length ; row++) {
                        sum+= m[row][columnIndex] ;
                }  return sum ;
        }
}
[[[2]]] //Sum of Diagonal

import java.util.Scanner ;
public class Task2 {
        public static void main(String[] args) {

                Scanner input = new Scanner (System.in);
                System.out.print("Enter row and column : ");
                int row = input.nextInt();
                int col = input.nextInt();
                double [][] arr = new double [row][col];

                System.out.print("Enter elements : ");
                for(int i = 0 ; i < row ; i++) {
                        for(int j = 0 ; j < col ; j++) {
                                arr[i][j] = input.nextDouble();
                        }
                }
                System.out.print("Sum of major diagonal : " +sumMajorDiagonal(arr));
        }
        public static double sumMajorDiagonal(double[][] m) {
                double sum = 0 ;
                for(int i = 0 ; i < m.length ; i++) {
                        for(int j = 0 ; j < m[i].length ; j++) {
                                if( i == j ) {
                                        sum+= m[i][j] ;
                                }
                        }
                } return sum ;
        }
}
[[[3]]] //Largest row column

import java.util.Scanner ;
public class Task3 {
        public static void main(String[] args) {

                Scanner input = new Scanner (System.in);
                int [][] Matrix = new int [4][4] ;
                System.out.print("Enter matrix elemenst : ");

                for(int row = 0 ; row < 4 ; row++) {
                        for(int col = 0 ; col < 4 ; col++) {
                                Matrix[row][col] = (int)(Math.random()*2);
                        }
                }
        System.out.println("Matix : ");

                for(int row = 0 ; row < 4 ; row++) {
                        for(int col = 0 ; col < 4 ; col++) {
                                System.out.print(Matrix[row][col] +" ");
                        } System.out.println();
                }
                System.out.println("largest column : "
+largestColumnIndex(Matrix,4));
                System.out.println("largest row : " +largestRowIndex(Matrix,4));
        }
        public static int largestRowIndex (int [][] arr , int row) {
                int largestRow = 0 ,rowSum = 0 ;
                for(int rowS = 0 ; rowS < row ; rowS++) {
                        int sum = 0 ;
                        for(int colS = 0 ; colS < arr[rowS].length ; colS++) {
                                sum+= arr[rowS][colS] ;
                        }
                        if(sum > rowSum) {
                                rowSum = sum ;
                                largestRow = rowS ;
                        }
                } return largestRow ;
        }
        public static int largestColumnIndex (int [][] arr , int col) {
                int largestCol = 0 ,colSum = 0 ;
                for(int colS = 0 ; colS < arr[0].length ; colS++) {
                        int sum = 0 ;
                        for(int rowS = 0 ; rowS < arr.length ; rowS++) {
                                sum+= arr[rowS][colS] ;
                        }
                        if(sum > colSum) {
                                colSum = sum ;
                                largestCol = colS ;
                        }
                } return largestCol ;
        }
}
```

[[[4]]] //largest Index

```
import java.util.Scanner ;
public class Task4 {
        public static void main(String[] args) {

                Scanner input = new Scanner (System.in);
                System.out.print("Enter row and column : ");
                int row = input.nextInt();
                int col = input.nextInt();
                double [][] arr = new double [row][col];

                System.out.print("Enter elements : ");
                for(int i = 0 ; i < row ; i++) {
                        for(int j = 0 ; j < col ; j++) {
                                arr[i][j] = input.nextDouble();
                        }
                }
        int[] location = locateLargest(arr) ;
                System.out.print("\nlargest element location [index] : ");

                for(int i = 0 ; i < location.length ; i++) {
                        System.out.print(location[i]+" ");
                }
        }
        public static int[] locateLargest(double[][] a) {
                double largest = a[0][0] ;
                int[] largestIndex = {0,0} ;
                for(int i = 0 ; i < a.length ; i++) {
                        for(int j = 0 ; j < a[i].length ; j++) {

                                if(a[i][j] > largest) {
                                        largest = a[i][j];
                                        largestIndex[0] = i ;
                                        largestIndex[1] = j ;
                                }
                        }
                } return largestIndex ;
        }
}
[[[5]]] //Sorting

import java.util.Scanner ;
public class Task5 {
        public static void main(String[] args) {

                Scanner input = new Scanner (System.in);
                System.out.print("Enter row and column : ");
                int row = input.nextInt();
                int col = input.nextInt();
                int [][] arr = new int [row][col] ;

                System.out.println("Enter elements : ");
                for(int i = 0 ; i < row ; i++) {
                        for(int j = 0 ; j < col ; j++) {
                                arr[i][j] = input.nextInt();
                        }
                }
                sort(arr);
                System.out.println("Sorted array : ");
                for(int i = 0 ; i < row ; i++) {
                        for(int j = 0 ; j < col ; j++) {
                                System.out.print(arr[i][j] +" ");
                        }
                        System.out.println();
                }
        }
        public static int [][] sort(int m[][]) {

                for(int i = 0 ; i < m.length ; i++) {
                        for(int j = 0 ; j < m.length -1 ; j++) {

                                if(m[j][0] > m[j+1][0]) {

                                        int temp = m[j][0]  ;
                                        int temp1 = m[j][1] ;
                                        m[j][0] = m[j+1][0] ;
                                        m[j][1] = m[j+1][1] ;
                                        m[j+1][0] = temp ;
                                        m[j+1][1] = temp1 ;
                                }

                                if(m[j][0] == m[j+1][0]) {

                                        if(m[j][1] > m[j+1][1]) {
                                                int temp = m[j][1] ;
                                                m[j][1] = m[j+1][1] ;
                                                m[j+1][1] = temp ;
                                        }
                                }
                        }
                }
                return m ;
        }
}
[[[6]]] // Shuffle

import java.util.Scanner ;
public class Task6 {
        public static void main(String[] args) {

                Scanner input = new Scanner (System.in);
                System.out.print("Enter row and column : ");
                int row = input.nextInt();
                int col = input.nextInt();
                int [][] arr = new int [row][col] ;

                System.out.println("Enter elements : ");
                for(int i = 0 ; i < row ; i++) {
                        for(int j = 0 ; j < col ; j++) {
                                arr[i][j] = input.nextInt();
                        }
                }
                shuffle(arr);
                System.out.println("Shuffled array : ");
                for(int i = 0 ; i < row ; i++) {
                        for(int j = 0 ; j < col ; j++) {
                                System.out.print(arr[i][j] +" ");
                        }
                        System.out.println();
                }
        }
        public static void shuffle(int[][] m) {
                int randRow ;
                for(int i = 0 ; i < m.length ; i++) {
                        for(int j = 0 ; j < m[i].length ; j++) {

                                do {
                                        randRow = (int)(Math.random()*m.length);
                                }while(randRow == i);
                        int [] temp = m[i] ;
                        m[i] = m[randRow] ;
                        m[randRow] = temp ;
                }
         }
```

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  }
}
[[[7]]] //Markov matrix

import java.util.Scanner;
public abstract class Task7 {
        public static void main(String[] args) {

                Scanner input = new Scanner (System.in);
                System.out.print("Enter row and column : ");
                int row = input.nextInt();
                int col = input.nextInt();
                double [][] arr = new double [row][col] ;

                System.out.println("Enter Matrix : ");
                for(int i = 0 ; i < row ; i++) {
                        for(int j = 0 ; j < col ; j++) {
                                arr[i][j] = input.nextDouble();
                        }
                }
                System.out.println(isMarkovMatrix(arr)? "Is a Markov matrix." : "Not
a Markov matrix.");
   }
        public static boolean isMarkovMatrix (double[][] m) {
                for(int col = 0 ; col < m[0].length ; col++) {
                        double sum = 0 ;
                        for(int row = 0 ; row < m.length ; row++) {
                                sum+= m[row][col];
                        }
                        if(sum != 1) {
                                return false ;
                        }
                } return true ;
        }
}
[[[8]]] // Identical Arrays

import java.util.Scanner;
public abstract class Task8 {
        public static void main(String[] args) {

                Scanner input = new Scanner (System.in);
                System.out.print("Enter row and column for matrix 1 : ");
                int row1 = input.nextInt();
                int col1 = input.nextInt();
                int [][] arr1 = new int [row1][col1] ;

                System.out.println("Enter Matrix : ");
                for(int i = 0 ; i < row1 ; i++) {
                        for(int j = 0 ; j < col1 ; j++) {
                                arr1[i][j] = input.nextInt();
                        }
                }

                System.out.print("Enter row and column for matrix 2 : ");
                int row2 = input.nextInt();
                int col2 = input.nextInt();
                int [][] arr2 = new int [row2][col2] ;

                System.out.println("Enter Matrix : ");
                for(int i = 0 ; i < row2 ; i++) {
                        for(int j = 0 ; j < col2 ; j++) {
                                arr2[i][j] = input.nextInt();
                        }
                }
                System.out.println(equals(arr1,arr2)? "Arrays are strictly
identical." : "Arrays are not strictly identical.");
   }
        public static boolean equals (int[][] m1 ,int [][] m2) {
                if(m1.length != m2.length) {
                        return false ;
                }
                for(int row = 0 ; row < m1.length ; row++) {
                        for(int col = 0 ; col < m1[row].length ; col++) {

                        if(m1[row][col] != m2[row][col]) {
                                return false ;
                        }
                }
        } return true ;
  }
}
```