**2D Arrays Lab 1 Basic Operations**

1. Write an Array2D class that will have a two-dimensional array of any given size as an instance variable.

**Write the constructor and printArray() method.**

Write methods to do the following using the 2D array (**not empty**):

* 1. return the maximum element. public int max()
  2. return minimum elements. public int min()
  3. return the median element. (the element that occurs in the middle) public double median()

Recall that median is calculated by averaging the two middle elements if the number of elements in a set is even.

* 1. return the element that occurs most frequently. (mode) public int mode()

You may assume there would be at least one mode in a set

* 1. return the average of all the elements in the array. public double average()
  2. return the element closest to 0. public int closestToZero()
  3. Print all the numbers greater than the average. public void biggerThanAverage()
  4. return the sum of any row of elements public int sumRow(int r) or return -1 if the column number is not legal
  5. return the sum of any column of elements public int sumCol(int c) or return -1 if the column number is not legal
  6. return the sum of the elements on the main diagonal public int sumMain() or return -1 if the matrix is not square
  7. return the sum of the elements on the minor diagonal; public int sumMinor() or return -1 if the matrix is not square

1. Write a Array2Dtester

a. Create a 5 x 5 integer array using an initialize list with elements from -9 to 9 (duplicates allowed)

print the array in matrix form and test all the methods.

b. Create a 15 x 15 integer array using random integers from -9 to 9 (duplicates allowed)

print the array in matrix form and test all the methods.

public class ArrayOp {

private int [][] array;

public ArrayOp(int[][] a) { array=a; }

public int[][] getArray() { return array; }

public void printArray(){

for (int j = 0; j<array.length; j++){

for (int k = 0; k< array[0].length; k++)

System.out.print(a[j][k]+” “);

System.out.println();

}

}

public class ArrayOpTester{

public static void main(String[] args){

int[][] temp = { { 1,2,3,4,5},{-1,-2, -3, -4 -5}, … };

ArrayOp a = new ArrayOp(temp);

System.out.println(“The max is “+max(a));

a.printArray();

System.out.println(“The max is “+a.min());