Problem Set 3 Exercise #25: Maximum Pair Frequency

Reference: Lecture 8 notes

Learning objectives: Two-dimensional array; Algorithm design

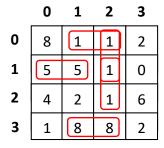
Estimated completion time: 60 minutes

Problem statement:

[CS1010 AY2010/11 Semester 1 Exam, Q6]

Consider a two-dimensional integer array mtx in which each element is a non-negative integer between 0 and 9 inclusive. We say that mtx contains a pair with value v if there exist two consecutive elements within the same row or column in mtx that have the value v.

For example, consider the following array:



It contains a total of five pairs:

- Pair 1: mtx[0][1] and mtx[0][2] with a value of 1
- Pair 2: mtx[0][2] and mtx[1][2] with a value of 1
- Pair 3: mtx[1][0] and mtx[1][1] with a value of 5
- Pair 4: mtx[1][2] and mtx[2][2] with a value of 1
- Pair 5: mtx[3][1] and mtx[3][2] with a value of 8

Your program should contain a static method

int getMaxPairFrequency(int[][] mtx)

that returns the maximum number of pairs of the same value contained in the given array mtx.

In the above example, **getMaxPairFrequency(mtx)** returns 3 corresponding to the number of pairs with a value of 1.

Complete the skeleton program PS3 Ex25 MaxPairFrequency.java for the above task.

A tip is given at the end of next page.

Sample run #1:

```
Enter the size of the matrix: 4 4
Enter elements row by row:
8 1 1 2
5 5 1 0
4 2 1 6
1 8 8 2
Maximum number of pairs = 3
```

Sample run #2:

```
Enter the size of the matrix: 4 5
Enter elements row by row:
8 1 1 1 2
5 5 5 1 5
4 4 4 6 5
1 1 8 8 8
Maximum number of pairs = 4
```

Useful tip:

Each array element is a non-negative integer value between 0 and 9 inclusive.