

## Problem Set 3 Exercise #26: Maximum Pair Frequency

**Reference:** Lecture 9 notes

**Learning objective:** Two-dimensional array

**Estimated completion time:** 50 minutes

### Problem statement:

[CS1010 AY2010/11 Semester 1 Exam, Q6]

Consider a 4\*4 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:

	0	1	2	3
0	8	1	1	2
1	5	5	1	0
2	4	2	1	6
3	1	8	8	2

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

Write a function:

```
int get_max_pairs(int mtx[4][4])
```

that returns the maximum number of pairs of the same value contained in array `mtx`. In the above example, `get_max_pairs(mtx)` returns 3 corresponding to the number of pairs with a value of 1.

Complete the skeleton program `max_pairs.c` for the above task.

A tip is given at the end of next page.

**Sample run #1:**

```
Enter values:
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 values:
8 1 1 1
5 5 5 1
4 4 4 6
1 1 8 8
Maximum number of pairs: 4
```

**Useful tip:**

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