

Contents

Two-Dimensional Arrays	1
Multiple Choices	1
Exercises	1
Problem: Toward a Crossword Puzzle Solver	2

Two-Dimensional Arrays

Solutions for those exercises.¹

Multiple Choices

1. What is the correct way of creating a 2-dimensional rectangular array of `int` with 5 rows and 2 columns named `myMatrix`?

- `int[][] myMatrix = new int[5][2];`
- `int[][] myMatrix = new int[2][5];`
- `int[,] myMatrix = new int[2, 5];`
- `int[,] myMatrix = new int[5, 2];`

2. Consider the following code:

```
int[,] grades = {{10, 20}, {30, 40}};  
Console.WriteLine(grades[1,0]);
```

What will it display?

- Nothing
- 10
- 20
- grades
- 30
- grades(1,0)
- 40

Exercises

1. Write a statement that creates a 2-dimensional rectangular array of `int` with 5 rows and 3 columns.
2. Write a statement that creates a 2-dimensional jagged array of `int` with 2 rows. The first row should contain an array containing 1, the second row should contain an array containing 2, 3.

¹https://princomp.github.io/exercises_w_sol/collections/2darrays

- Write a declaration for a 2-dimensional rectangular array of `int` containing the following data:

```
_____
|
|_____
| 10 20 30
| 40 50 60
| 70 80 90
|_____
```

- Write a declaration for a 2-dimensional ragged array of `int` containing the following data:

```
_____
|
|_____
| 10 20
| 40
| 70 80 90
|_____
```

- Suppose we have a 2-dimensional rectangular array named `temp` that has been declared and initialized. How can we know the number of rows in this array?
- Suppose we have a 2-dimensional rectangular array named `temp` that has been declared and initialized. How can we know the number of elements in this array?
- Write a program that display "Every row contains its own index" if the 2-dimensional rectangular array of `int` `matrix` is such that its first row contains the value 0, its second row contains the value 1, etc.
- Write a program that display the average of each row of a 2-dimensional jagged array of `int` `jArray`.
- Write a program that display the sum of the values on the diagonal of a 2-dimensional rectangular array of `int` `jArray`.

Problem: Toward a Crossword Puzzle Solver

The goal of this problem is to work toward the creation of a program that solve crossword puzzles. We will reason in the simple case where the "word" is actually simply a pair of number (so, "1, 2" or "8, 101").

In the following, assume given two `int` variables `first` and `second`, as well as a 2-dimensional rectangular array `values`.

- Write a program that display "pair found" if `first` and `second` occur next to each other in the same row.

2. Edit your program so that "pair found" is displayed also if `second` occurs before `first` in the same row.
3. Edit your program so that "pair found" is displayed also if `first` occurs "above" `second` (that is, if they are next to each other in the same column),
4. Edit your program so that "pair found" is displayed also if `second` occurs "above" `first`,
5. Edit your program so that "pair found" is displayed also if `first` and `second` occur diagonally,
6. Edit your program so that "pair found" is displayed also if `first` and `first` occur anti-diagonally.

Test your program thoroughly, possibly bundling it in a **static** class to ease testing and debugging.