

CSC345 Discussion 2

Turnin demo, Project 1, n-D arrays

turnin Demo

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Project 1

Some Java methods that you might find helpful.

`Character.getNumericValue()` : This method takes a character and returns its numerical value as an int. So `Character.getNumericValue('4') = 4`. This method returns -1 if the value does not have a numeric representation.

`"String".charAt(int)`: gets the character at the specified index for the specified string. `"Hello".charAt(1) = 'e'`.

- + : When you use + with two strings the strings become concatenated. This can also be used to add a char to a string.

2-D Arrays

An easier way to interpret data. This makes it easier to code and debug.

Suppose that we want to keep track of student test scores. This can be done with a 10x5 2d array.

	Assignment	Midterm 1	Midterm 2	Final exam	Average
Student 1	84	85	100	98	0
Student 2	66	69	74	77	0
Student 3	88	91	76	74	0
Student 4	85	89	90	85	0
Student 5	94	85	80	81	0
Student 6	51	75	71	65	0
Student 7	78	74	58	76	0
Student 8	100	98	60	83	0
Student 9	77	82	70	73	0
Average	0	0	0	0	0

How Do They Work?

Depending on the language you are using arrays might be stored differently.

RMO: Row Major Order, languages like C, Python, Java(?) align rows.

CMO: Column Major Order, languages like Matlab and R align columns.

```
short twod [][ ] = new short [3][4]; [ = {{6,0,8,2},{1,5,3,6},{9,4,7,1}}; ]
```

	0	1	2	3
0	6	0	8	2
1	1	5	3	6
2	9	4	7	1

	Row 0				Row 1				Row 2			
RMO:	6	0	8	2	1	5	3	6	9	4	7	1
	Col 0				Col 1				Col 2			
CMO:	6	1	9	0	5	4	8	3	7	2	6	1

Why one over the other.

CMO is mainly used in mathematical languages as it help with linear indexing. And can be used to better reshape the array.

RMO easier to access data. Based on how its stored.

OO 2D Arrays

In OO languages, arrays are considered to be objects. Thus, a 1-D array is an object, and its elements could be objects. But is a 2-D array one collection (a single 2-D array object) or a collection of collections (a 1-D array object of 1-D array objects)?

Java's view of 2-D arrays is shown in this representation: of a 2x3 2-D array:

