



CMPINF0401

Recitation

TUESDAYS 11:00-12:50

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SLIDES CREDIT TO PROF. DEVINE'S MATRICES.PDF

Overview

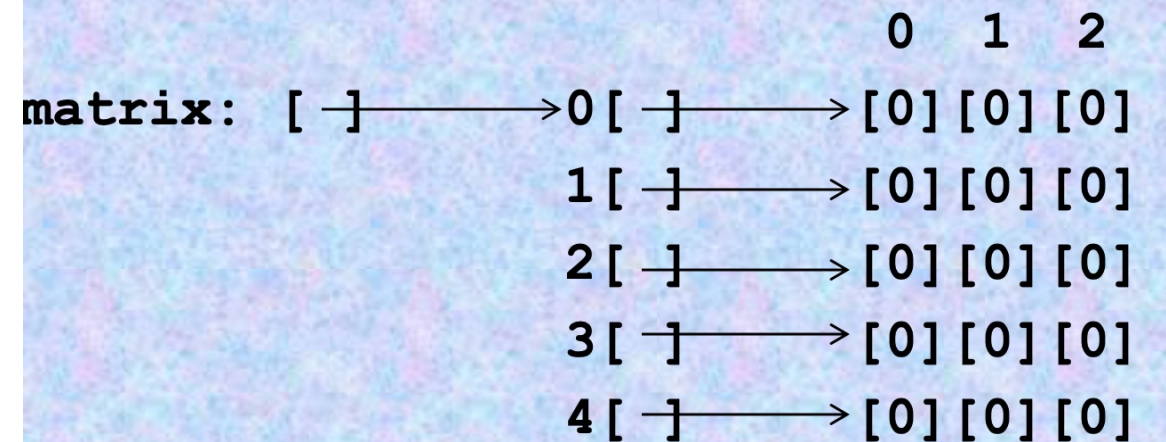
- ▶ Matrices
- ▶ Lab 6b

Matrices/Two-Dimensional Arrays

- ▶ A 2D array is just an array of arrays
 - ▶ We may visualize this as a grid to make it look like a matrix (like we learned in math classes)
 - ▶ But it's just an array of arrays
- ▶ Initialized as so: `int matrix[][];`
 - ▶ This makes an array of int arrays
- ▶ `int[][] matrix = new int[5][3]`
 - ▶ Makes a 5x3 array of arrays

Matrices/Two-Dimensional Arrays

- ▶ Each row of this array is a 1D array. So, instead of `refVar[index]` holding a single int element, it contains an array of int elements.
- ▶ Properties of this matrix:
 - ▶ `matrix.length == 5`
 - ▶ `matrix[0]` is a reference to the first array
 - ▶ `matrix[0].length == 3`
 - ▶ Length of the specific row



The diagram illustrates a 2D array structure. On the left, the variable `matrix` is shown pointing to a bracketed array. This array contains five references, labeled 0 through 4, each pointing to a 1D array. Above the 1D arrays, the column indices 0, 1, and 2 are marked. Each of the five 1D arrays contains three elements, all of which are the value 0.

```
matrix: [ ] → 0 [ ] → [0] [0] [0]
          1 [ ] → [0] [0] [0]
          2 [ ] → [0] [0] [0]
          3 [ ] → [0] [0] [0]
          4 [ ] → [0] [0] [0]
```

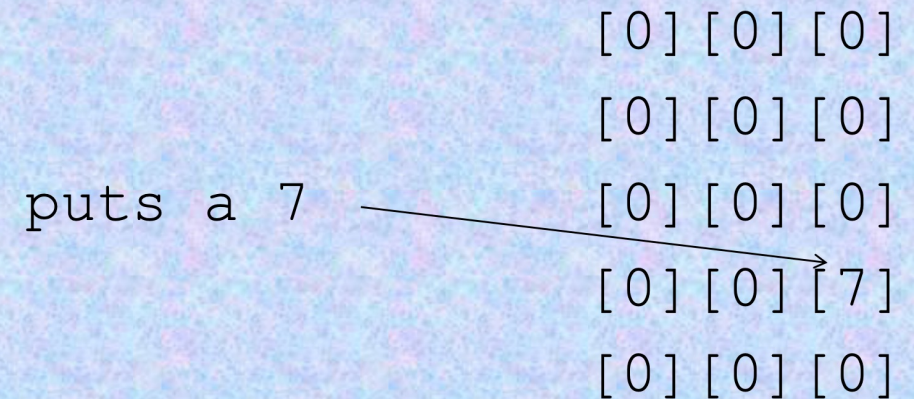

Matrices/Two-Dimensional Arrays

► How to access elements at a specific index:

► `matrix[row][col];`

```
matrix[3][2] = 7
```

```
           [0][0][0]  
           [0][0][0]  
puts a 7   [0][0][0]  
           [0][0][7]  
           [0][0][0]
```



Loop through a 2D array

```
int[][] matrix = new int[5][3];

for (int row=0 ; row < matrix.length ; row++ )
    for (int col = 0 ; col < matrix[row].length ; col++)
        matrix[row][col] = row+col;
```

`matrix []` → `[]` → `[0][1][2]`
`[]` → `[1][2][3]`
`[]` → `[2][3][4]`
`[]` → `[3][4][5]`
`[]` → `[4][5][6]`

Lab 6b

▶ Due 3/7

▶ https://canvas.pitt.edu/courses/127916/files/8050368?module_item_id=2735295

Lab 6b

- ▶ The goal is to find the words in the two-dimensional array and then print them out.
 - ▶ For example, the first word is *dank* and we can see that it spans from `board[4][1]` to `board[4][3]`.
 - ▶ So, make a loop (either for or while) to increment your column index while keeping the row hardcoded and print out letter by letter until the whole word is printed.
 - ▶ Follow the same instructions for the next two words as well.