Programming Language Lab

Bibhas Adhikari

IIT Kharagpur

October 13, 2020

Character arrays

- Elements in a character array hold characters plus a special null termination character
- the null character is represented by the character constant $'\backslash 0'$
- Character arrays can be initialized in a many ways
  - $char\ cName[\,] = \{'O','l','i','v','i','a','\backslash 0'\};$
  - $char\ cName[\,] = "Olivia";$
- Searching One-Dimensional Arrays

Two-dimensional Array

- Two-dimensional arrays can be visualized as a table with rows and columns (e.g. a checkerboard, chessboard, or spreadsheet)
- In C, two-dimensional arrays are implemented as single-dimension arrays with pointers to other single-dimension arrays. For ease of understanding, though, envision two-dimensional arrays as a grid
- Two-dimensional arrays are created similar to one-dimensional arrays, but with one exception: two-dimensional arrays must be declared with two separate element numbers:
  - `int ITwoD[3][3];`

	Column 0	Column 1	Column 2
Row 0	ITwoD[0][0]	ITwoD[0][1]	ITwoD[0][2]
Row 1	ITwoD[1][0]	ITwoD[1][1]	ITwoD[1][2]
Row 2	ITwoD[2][0]	ITwoD[2][1]	ITwoD[2][2]

Two-dimensional Array

Initialization

- You can initialize a two-dimensional array in a number of ways
  - ▸ Hardway:
    $int\ iTwoD\ [3][3] = \{\{0, 1, 2\}, \{0, 1, 2\}, \{0, 1, 2\}\};$
  - ▸ Using nested loop structure:
    $for\ (x = 0; x <= 2; x++)\{$
    $for\ (y = 0; y <= 2; y++)$
    $iTwoD\ [x][y] = (x + y);$
    $\}$

Searching Two-Dimensional Arrays

- One must use the nested looping techniques described above
- The nested looping constructs enable to search each array element individually