



I'm not robot



**I am not robot!**

If we want to represent a 2D structure we need to use Multidimensional Arrays. A two-dimensional array is used to represent a matrix or a table. Example: the following table that describes the distances between the cities can be represented using a two-dimensional array.

	Chicago	Boston	New York	Atlanta	Miami	Dallas	Houston
Chicago	0	945	1395	1600	1585	1205	1705
Boston	945	0	213	413	1033	1393	1438
New York	1395	213	0	663	1603	1393	1743
Atlanta	1600	413	663	0	1603	1203	1793
Miami	1585	1033	1603	1603	0	1393	1743
Dallas	1205	1393	1393	1203	1393	0	1793
Houston	1705	1438	1743	1793	1743	1793	0

Data can be read in a 2D array and data can be printed from a 2D array, one element at a time.

**Single and Multidimensional Arrays: Array Declaration and Initialization of arrays – Arrays as function arguments.** The two-dimensional (2D) array in C programming is also known as matrix. Its declaration has the following form, `data_type`. Each element in the 2D array must be of the same type, either a primitive type or object type. The starting address of the array in memory, Number of bytes per element, Number of columns in the array. The above three pieces of information must be known.

**Passing 2D Arrays** Similar to that for 1D arrays. **Returning 2D Arrays.** Consider the following program:

```

#include <stdio.h>
int main()
{
    int a[10], b[3][5];
    printf("a: %p\n", a);
    printf("b: %p\n", b);
    printf("a+%p\tb+%p\n", a+1, b+1);
}

```

C allows us to define such tables of items by using two-dimensional arrays. Let's take a look at the following C program, before we discuss more about two-dimensional arrays.

**General form:** `type array_name[row_size][column_size];` Examples: `int arr[10][5];`

**Multidimensional Arrays.** A two-dimensional array is, in essence, a list of one-dimensional arrays. **Returning 2D Arrays.** `free(arr);` For each call to `malloc` you should have a corresponding `free` call. In the memory of a computer there is no such thing as a multidimensional structure.

**Simple Two dimensional(2D) Array Example** Rather, the address of the first element is passed. Example: the following table that describes the distances between the cities can be represented using a two-dimensional array. C allows us to define such tables of items by using two-dimensional arrays. For calculating the address of an element in a 2D array, we need: – The starting address of the array in memory. An array of arrays is known as 2D array. For calculating the address of an element in a 2D array, we need: – The starting address of the array in memory. A matrix can be represented as a table of rows and columns. All addresses in memory are essentially sequentially and 1D. – The array contents are not copied into the function. We can read the matrix in a 2D array and print it in a C program – – – – Passing 2D Arrays. The array contents are not copied into the function. Subscripted variables can be used just like a variable: `rating[0][3] = 5;` Array indices must be of type `int` and can be a literal, variable, or expression. We can visualize a two-dimensional array as an array of one-dimensional arrays. A two-dimensional array has two subscripts/indexes. General form: `type array_name[row_size][column_size];` Examples: `int arr[10][5];` Consider the following program:

```

#include <stdio.h>
int main() // 2DArray.c
{
    int a[10][5], b[3][5];
    printf("a: %p\n", a);
    printf("b: %p\n", b);
    printf("a+%p\tb+%p\n", a+1, b+1);
}

```

Similar to that for 1D arrays. The first subscript refers to the row, and the second, to the column. `rating[3][j] = j;` If an array element does not exist, the Java runtime system will give you an `ArrayIndexOutOfBoundsException`. The elements are printed nicely in matrix form. – Number of bytes per element. A two-dimensional array to represent a matrix or a table. } { printf(“”); for (q=0; q<[p][q]); } return 0; For calculating the address of an element in a 2D array.