**Introduction to Computing**

**Lab Manual**

**Week 04 – Lab 02**

****

**Arrays – 2D**

**Session: FALL 2012**

**Faculty of Information Technology**

**UCP Lahore Pakistan**

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# Objective

* To be able to write a C++ program using 2D arrays.

# Things to remember:

* Indent your code
* Comment your code
* Use meaningful variable names
* Plan your code carefully on a piece of paper before you implement it

# Lab Task 1

Write a C++ program with 2 dimensional integer array of size 4x4. Initialize the array with 0 and get integer values from user in column wise order as shown below.

|  |  |  |  |
| --- | --- | --- | --- |
| 1st value | 5th value | 9th value | 13th value |
| 2nd value | 6th value | 10th value | 14th value |
| 3rd value | 7th value | 11th value | 15th value |
| 4th value | 8th value | 12th value | 16th value |

Print the array in reverse order as shown below

16th value, 15th value, 14th value, ............, 3rd value, 2nd value, 1st value

# Lab Task 2

Continuing from part 1, take the transpose of the array and print the content of the array row wise. Output should be as follow.

1st value, 2nd value, 3rd value, ................., 14th value, 15th value, 16th value.

# Lab Task 3

Write a C++ program to create an integer 2d array of size n x 8 where n is any positive integer of your choice. Take n integer values from user and store these values into 1st row. No value should be greater than 99999999. Split the integer into its digits and store each digit into the corresponding column as shown below.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| 10101010 | 12345678 | 03306763 | 91029876 | 11111212 |
| 1 | 1 | 0 | 9 | 1 |
| 0 | 2 | 3 | 1 | 1 |
| 1 | 3 | 3 | 0 | 1 |
| 0 | 4 | 0 | 2 | 1 |
| 1 | 5 | 6 | 9 | 1 |
| 0 | 6 | 7 | 8 | 2 |
| 1 | 7 | 6 | 7 | 1 |
| 0 | 8 | 3 | 6 | 2 |

# Lab Task 4

Write a C++ program, to create a name directory of friends, you are not allowed to use an of the string functions. User can enter any name of length not more than 15 and maximum 100 names can be stored into the directory. Your program should maintain directory in a sorted order. 1st column of the array is index. Look at the example below where name of friends are Hassan, Ahmed, Waleed, Ahmer, Ubair, Zaid

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 1 | A | H | M | E | D |  |  |  |  |  |
| 2 | A | H | M | E | R |  |  |  |  |  |
| 3 | H | A | S | S | A | N |  |  |  |  |
| 4 | W | A | L | E | E | D |  |  |  |  |
| 5 | Z | A | I | D |  |  |  |  |  |  |

Print the names on the screen.

# Lab Task 5

Write a C++ program, to create 2 2d arrays of integer type of equal size of your choice. For simplicity let us create 2 3x3 arrays. Use these arrays as matrices and apply matrix multiplication. Store results into another array of same size and print the values.