**Introduction to Computing**

**Lab Manual**

**Week 04 – Lab 01**

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**Character Arrays Note(Use Strings as there are no character arrays in Java!)**

**Session: FALL 2012**

**Faculty of Information Technology**

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# Objectives

* Basic Introduction to char Arrays.
* The structure of a char array
* Null termination Concepts
* The concept of functionality relying on the ‘\0’
* Understanding the Difference between integer array and char arrays

# Introduction

* The way a group of integers can be stored in an integer array, similarly a group of characters can be stored in a character array. Character arrays are many a time also called strings.
* Many languages internally treat strings as character arrays, but somehow conceal this fact from the programmer. Character arrays or strings are used by programming languages to manipulate text such as words and sentences.
* A string constant is a one-dimensional array of characters terminated by a null ( ‘\0’ ). For example,

char name[ ] = { 'H', 'A', 'E', 'S', 'L', 'E', 'R', '\0' } ;

* Each character in the array occupies one byte of memory and the last character is always ‘\0’. What character is this? It looks like two characters, but it is actually only one character, with the indicating that what follows it is something special.
* ‘\0’ is called null character. Note that ‘\0’ and ‘0’ are not same. ASCII value of ‘\0’ is 0, whereas ASCII value of ‘0’ is 48. Figure 9.1 shows the way a character array is stored in memory. Note that the elements of the character array are stored in contiguous memory locations.
* The terminating null (‘\0’) is important, because it is the only way the functions that work with a string can know where the string ends. In fact, a string not terminated by a ‘\0’ is not really a string, but merely a collection of characters.

# Lab Task 1

Write a C++ program to get characters of user’s name in an array. For simplicity assume that no name contains more than 15 characters therefore declare a character array of maximum value 25. Print the name of the user onto the screen but it should not print junk value of unused indexes.

For example if the name of the user is ‘Ali’ it should only print Ali not any junk/garbage values after the last character of the name.

# Lab Task 2

Write a C++ program to match two strings and Display “Strings are Equal” if all characters in that array match.

# Lab Task 3

Write a Program that takes a Char Array as an Input and Display:

1. All the characters of the array
2. Total Number of characters in the array
3. All the vowels in the array
4. Total number of vowels in the array.

**Instructions:**

Each task should be performed in a different function.

Your **main()** function will only **call** these functions one by one.

# Lab Task 4

Write a program that implements **Creaser Cipher encryption technique**.

**Details:**

In this technique, each alphabet is move forward by two alphabets like A is replaced with C and X is replaced with Z. Your program will input message of just 10 characters (only alphabets) and then print its encrypted form.

**Sample Output:**

                Enter Message: ABCDEFGHIJ

                Result: CDEFGHIJKL

**Hints**

* You have to divide your Problem into sub-problems.
* Make separate functions for each task to get Maximum credit.
* In Task 1,Make a menu driven program
* In Task 2, use ASCII values.