

National University of Computer and Emerging Sciences



Lab Manual
for
Programming Fundamentals

Course Instructor	Ms. Amina Batool
Lab Instructor(s)	Ms. Sonia Anum Ms. Mamoon Akbar
Section	PF C
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Department of Computer Science
FAST-NU, Lahore, Pakistan

Lab Manual 11

Objectives

In this lab we will mainly perform activity

- C-string
- Character array

String is a collection of characters. There are two types of strings commonly used in C++ programming language:

- Strings that are objects of string class (The Standard C++ Library string class)
- C-strings (C-style Strings)

C-strings

In C programming, the collection of characters is stored in the form of arrays. This is also supported in C++ programming. Hence it's called C-strings.

C-strings are arrays of type `char` terminated with null character, that is, `\0` (ASCII value of null character is 0).

How to define a C-string?

```
char str[] = "C++";
```

In the above code, `str` is a string and it holds 4 characters.

Although, "C++" has 3 character, the null character `\0` is added to the end of the string automatically.

Alternative ways of defining a string

```
char str[4] = "C++";  
  
char str[] = {'C', '+', '+', '\0'};  
  
char str[4] = {'C', '+', '+', '\0'};
```

Like arrays, it is not necessary to use all the space allocated for the string. For example:

```
char str[100] = "C++";
```

Example 1: C++ String to read a word

C++ program to display a string entered by user.

```
#include <iostream>
using namespace std;

int main()
{
    char str[100];

    cout << "Enter a string: ";
    cin >> str;
    cout << "You entered: " << str << endl;

    cout << "\nEnter another string: ";
    cin >> str;
    cout << "You entered: "<<str<<endl;

    return 0;
}
```

Output

```
Enter a string: C++
You entered: C++

Enter another string: Programming is fun.
You entered: Programming
```

Notice that, in the second example only "Programming" is displayed instead of "Programming is fun".

This is because the extraction operator >> works as `scanf()` in C and considers a space " " has a terminating character.

Example 2: C++ String to read a line of text

C++ program to read and display an entire line entered by user.

```
#include <iostream>
using namespace std;

int main()
{
```

```

char str[100];
cout << "Enter a string: ";
cin.get(str, 100);

cout << "You entered: " << str << endl;
return 0;
}

```

Output

```

Enter a string: Programming is fun.
You entered: Programming is fun.

```

To read the text containing blank space, `cin.get` function can be used. This function takes two arguments.

First argument is the name of the string (address of first element of string) and second argument is the maximum size of the array.

In the above program, `str` is the name of the string and `100` is the maximum size of the array.

Problem 1:

Write a program that

- Read character from a file and store it in character array.(for this first you make a file and write on it “LAB PROGRAMMING FUNDAMENTAL”)
- Write your name in another file.

Problem 2:

Write a function that returns an integer and accepts a character array as an argument. The function should count the number of characters in the character array and return that number. Demonstrate the function in a simple program that asks the user to input a string, passes it to the function, and then displays the function’s return value.

Problem 3:

Write a function that accepts a C-string as an argument and displays its contents backward. For instance, if the string argument is “Gravity” the function should display “ytivarG”. Demonstrate the function in a program that asks the user to input a string and then passes it to the function.

Problem 4:

Write a function that accepts a C-string as its argument. The function should count the number of vowels appearing in the string and return that number. Write another function that accepts a C-string as its argument. This function should count the number of consonants appearing in the string and return that number. Demonstrate these two functions in a program that performs the

following steps:

1. The user is asked to enter a string.
2. The program displays the following menu:
 - A) Count the number of vowels in the string
 - B) Count the number of consonants in the string
 - C) Count both the vowels and consonants in the string
 - D) Exit the program
3. The program performs the operation selected by the user and repeats until the user selects E to exit the program

Problem 5:

Write a program that write 20 numbers in file and then read numbers from a file and separate even, odd and prime numbers in 3 separate arrays and displays it.

Problem 6:

Write a function in C++ called search that accepts a sentence and a substring as C-string arguments and returns the number of times the substring appears in that sentence. So e.g. if the user enters “programming is taught in programming fundamentals lab” and the substring to search within this sentence is “programming” then your function should return the value 2 as it appears twice in this sentence. Demonstrate the function in a program that asks the user to input a sentence and a word to look for within the sentence and then passes them as arguments to the function.