National University of Computer and Emerging Sciences

Lab Manual # 10

Programming Fundamentals

(Section BSE-1A)

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Objectives

The objectives of this lab are to cover the following:

- Character arrays
- 2D arrays

Question No 1 (2-D integer array):

Please implement in C++ the functions used in the main function given below. **Input** and **Output** both take a 2D integer array, number of rows and number of columns as parameters. The input function should populate the array with integer data and the output function should display the contents.

```
const int rows=3;
const int cols=2;

int main()
{
	int data[rows][cols];

	cout<<"Input data in matrix with "<<rows<<" rows and "<<cols<<"columns"<<endl;
	input(data, rows, cols);

	cout<<"Output is: "<<endl;
	output(data, rows, cols);

	return 0;
}
```

Question No 2:

Write a function in C++ named **Upper** that takes as input a character array and converts all the lower case alphabets (ASCII 97 to 122) in a sentence (input by the user) to upper case.

Sample Input:

The weather is cold

Sample Output:

THE WEATHER IS COLD

Question No 3:

Write a function in C++ called **numberOfWords** that accepts a sentence as a C-string argument and returns the number of words contained in the sentence. For instance, if the string argument is “Four score and seven years ago” the function should return the number 6. Demonstrate the function in a program that asks the user to input a string and then passes it to the function. The number of words in the string should be displayed on the screen

Question No 4:

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.