National University of Computer and Emerging Sciences



Lab Manual 07

Programming Fundamentals

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| Section | F |
| Semester | Fall 2020 |

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## Objectives

After performing this lab, students shall be able to:

* Have an improved problem-solving ability
* Nested loops
* Implement functions
* Single dimension arrays

Note: For each of these questions, write the C++ program.

**TASK 1:**

Write a c++ program to print the pattern. User will enter the height. Take the input using one function and give output with the other function. Both functions should be called from the main and also you are not allowed to use global variable.

**Sample Input:**

Enter height: 10

**Sample Output:**



**TASK 2:**

Write a C++ program to get integer input in an array of size 15 and then sort the numbers in both ascending and descending orders and display them. Also find the maximum and minimum values from the array.

Use separate functions for inputs and outputs.

**TASK 3:**

Write a C++ program to read elements in an array and find its reverse.

Example:

If the elements of the array are: 10, 5, 16, 35, 500

Then its reverse would be: 500, 35, 16, 5, 10

That is if

array[0] = 10

array[1] = 5

array[2] = 16

array[3] = 35

array[4] = 500

Then after reversing array elements should be

array[0] = 500

array[1] = 35

array[2] = 16

array[3] = 5

array[4] = 10

Note: You can only use one array and its size should be 7 at least. You need to take the values of array from the user. Also you need to swap the value in a loop.

**TASK 4:**

Declare a character array in your program:

“I am currently studying at FAST NUCES, Lahore”

Then take a word from the user as input and search that whether the word exists in the array or not. Assume that length of word (input) can be 20 at max.

**Hint: Each character array has a “NULL” at the last index**

**TASK 5:**

Create an array of size 100. Fill this array with random numbers in the range [–50, 150]. In this array, there should be no number which is a multiple of 4. Display this array on the output screen. Ask the user to enter a number in the given range. If that number is a multiple of 4, display an error. Otherwise, output the number of times that number is found in this array.

**Hint:**

v1 = rand() % 100; // v1 in the range 0 to 99

v2 = rand() % 100 + 1; // v2 in the range 1 to 100

v3 = rand() % 30 + 1985; // v3 in the range 1985-2014

**Post Lab**

**TASK 6:**

Write a C++ program to read elements in two arrays and Compute Intersection and Difference of two arrays.

Example: If elements of array A = 1, 2, 4, 6, 9, 15

Elements of array B = 2, 9, 8, 1

Intersection array in ascending order = 1, 2, 9

Subtracted array in ascending order = 4, 6, 15

Assume Array\_a, array\_b are of size 5, and both new arrays are also have same size.

**TASK 7:**

Write a program to ask the user to enter 10 numbers. Store these in an array.

Implement the following in 4 separate functions.

a. Find the second maximum and second minimum numbers in the array

b. Find and display sum of these numbers

c. Find and display average of these numbers

d. Check if the array is sorted in ascending order. If it is, display “Sorted in

ascending order”. If not, then check if the array is sorted in descending order. If it is, display “Sorted in descending order”. If not, display “Neither sorted in ascending nor descending order”, sort the array and then display.