National University of Computer and Emerging Sciences



Lab Manual

for

Programming Fundamentals

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| Section | BDS-1D |
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## Objectives

After performing this lab, students will be able to:

* Write C++ Code for the problems involving 1D & 2D arrays.

**Instructions**

## For each problem, your filename should be “q Number”.cpp. e.g For Problem 1, create “q1.cpp”.

## Zip all files in a folder and your submission zip filename must be your rollno. e.g “21L1234.zip”. Note your zip file shall contain all the .cpp files for the problems you solved.

## Submit the zip folder on Google classroom.

## Plagiarism is strictly prohibited.

## Good Luck.

## Problems

**Write C++ Code of the following Problems using For Loop.**

**Problem#1**

Write a program that takes two matrices as input and return their subtraction.

|  |  |
| --- | --- |
| Input | **Output** |
| Enter size of row:2  Enter size of column:2  Enter elements of matrix A  6 7  5 1  Enter elements of matrix B  4 0  7 5 | A-B  **2 0**  **-2 -4** |

**Problem#2**

Write a function that takes an integer array and data to be searched and implements linear search algorithm. This algorithm examines each element in the array until it finds a match, starting at the beginning of the array until the end. The search is finished and terminated once the target element is located. If the target element is not present in the array then it should print that the search was unsuccessful. The elements of array are.

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| 9 | 55 | 60 | 81 | 49 | 66 | 49 | 10 |

|  |  |
| --- | --- |
| Input | **Output** |
| **Enter search element:** 49 | 49 is found at index 5 in the array. |

**Problem#3**

Write a program that generates a 2D array of ten random integers and compare it with Premium Bond Number entered by user to announce Premium bond winner.

**Note:**

For random number generator include following header file and code.

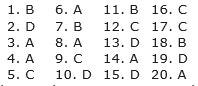
#include <cstdlib>

int r = (rand() % 9) + 1;

|  |  |
| --- | --- |
| Input | **Output** |
| Enter your Premium Bond number:  |  |  |  |  |  | | --- | --- | --- | --- | --- | | **8** | **6** | **5** | **4** | **3** | | **2** | **2** | **8** | **4** | **5** | | **Premium Bond Prize Winner:**   |  |  |  |  |  | | --- | --- | --- | --- | --- | | **8** | **9** | **7** | **4** | **3** | | **2** | **2** | **8** | **4** | **5** |   **You Lost the prize from 2 numbers.** |

**Problem#4**

An IELTS examiner wants you to prepare a program that grades user exams. The Exam comprises over 20 MCQs type questions. Here are the correct answers.



It stores the answer in an array and asks the user to input their answer. Then it compares the answers and grade the student based on following criteria.

* A grade if correctly answered questions are >=18
* B grade if correctly answered questions are >=14
* C grade if correctly answered questions are >=10
* Fail if a student gets less than 50 percent in exam.

|  |  |
| --- | --- |
| Input | **Output** |
| Enter your answers. | **You got A grade** |

**Problem#5**

Write a program that takes string as user input and convert lower case string into upper case string and vice versa.

|  |  |
| --- | --- |
| Input | **Output** |
| Enter the string: pAkisTan | PaKIStAN |

**Problem#6**

Write a program that takes an array of cstrings (2d null terminated char array) of students names in a class of 50 as input and then sort these names alphabetically (by using bubble sort or selection sort).

|  |  |
| --- | --- |
| Input | **Output** |
| Enter Student names:  Furqan  Saim  Asher  Hashir  Navroz……………….  Enter 1 for Bubble Sort and 2 for Selection sort:1 | Student Names after applying Bubble Sort:  Asher  Furqan  Hashir  Navroz  Saim…………………… |