CL-1002
Programming Fundamentals - Lab
Lab # 13

Objectives:

- Loops/Nested Loops
- 1D arrays
- 2D arrays
- Strings
- C-Strings /Character arrays
- Practice tasks

Note: Carefully read the following instructions (*Each instruction contains a weightage*)

1. Use proper **font family** and **font size** of **heading**, **sub heading** and **normal text**.
2. First think about statement problem then write/draw your logic on copy.
3. Attach the screen shots of your code in word file with execution (cpp project).
4. File (Word) tittle should in proper format (**23F-1001-Lab2**)
5. You have to submit both (**word + Project in zip/archive**) files.
6. **Upload separate word file and archive/zip of your project.**
7. **50% marks would be deducted on wrong formatting.**
8. **No submission will be accepted after deadline.**
9. Do not copy from any source otherwise you will be penalized with negative marks.
10. Complete your lab **within given Time Slot**.

Problem: Write C++ code for the following statements

1. **Write a C++ code that change every letter in a given string with the letter following it in the alphabet** (i.e. a becomes b, A becomes B, z becomes a) (Marks 5)

   Hint:
```
if (ch == 'z' || ch == 'Z') {
        ch = ch - 25;
    }
else {
        ch = ch + 1;
    }
```

2. **Write a C++ program to capitalize the first letter of each word of a given string. Words must be separated by only one space.** (Marks 5)
   Input: hello word program
   Output: Hello Word Program
   Hint: ASCII code for a space character is 32

3. **Write a program that prompts the user to input a string. The program then removes all the vowels from the string. For example, if str = "There", then after removing all the vowels, str = "Thr". After removing all the vowels, output the string.** (Marks 5)

4. **Write a C++ program that input string (including blank spaces) find the largest word in a given string.** (Marks 5)
   Example:
   Sample Input: Welcome to C++ programming.
   Sample Output: programming

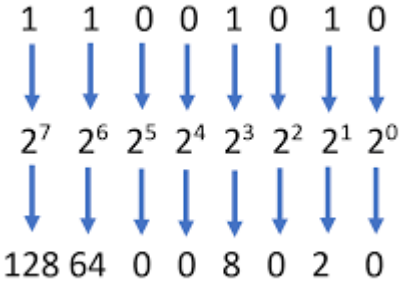
5. **Write a C++ program to input string and check whether a given string is a Palindrome or not.**
   A palindrome is a word, number, phrase, or other sequence of characters which reads the same backward as forward, such as madam, racecar. (Marks 10)
   Example:
   Sample Input: madam
   Sample Output: True

6. **Write a C++ program to take transpose of the matrix (2D array of size 4 by 4).**
   Sample Input: (Value Taken from User then Display Like This) (Marks 15)
   | 1 2 2 2 |
   | 1 2 4 5 |
   | 1 2 5 3 |
   | 7 2 3 4 |
   Sample Output:
   | 1 1 1 7 |

| 2 2 2 2 |
| 2 4 5 3 |
| 2 5 3 4 |

7. **The history teacher at your school needs help in grading a True/False test. The students' IDs and test answers are stored in a file. The first entry in the file contains answers to the test in the form: TFFTFFTTTTFFTFTFTFTT Every other entry in the file is the student ID, followed by a blank, followed by the student's responses.**
   For example, the entry: ABC54301 TFTFTFTT TFTFTFFTTFT indicates that the student ID is ABC54301 and the answer to question 1 is True, the answer to question 2 is False, and so on. This student did not answer question 9. The exam has 20 questions, and the class has more than 150 students. Each correct answer is awarded two points, each wrong answer gets one point deducted, and no answer gets zero points. Write a program that processes the test data. The output should be the student's ID, followed by the answers, followed by the test score, followed by the test grade. Assume the following grade scale: 90%–100%, A; 80%–89.99%, B; 70%–79.99%, C; 60%–69.99%, D; and 0%–59.99%, F. (Marks 15)

8. **Write a computer program that creates an integer array of size 8. Asks the user to populate its indexes with 1 and 0 as taken input by the user. Then shows what value it becomes if convert the binary to decimal.** (Marks 20)
   Sample Input: [1, 1, 0, 0, 1, 0, 1, 0]
   Sample Output: 202



Best of Luck ☺

"It is better to fail in originality than to succeed in imitation." — Herman Melville