18B17CI472-ALGORITHMS LAB (ALGO Lab)
Lab 1

NOTE:

- This lab is to be completed individually. Do not share your work or code with anyone else.

- You can use any programming language that you like; we suggest Python, C++, or C.

- For all of our labs, please avoid using Google to find suggestions or solutions. The goal is to use your own brain to work these problems out, which will help you develop the skills to do well in the exams and, more importantly, become a substantially better computer programmer.

- First two Lab exercises are for revision.

- You have to make lab report in hard copy.

LAB-1

This lab sheet is designed to test your basic Python\C\C++ programming skills. Each lab consists of three problem and you have to solve at least two of them. Your work is checked in the next lab with lab record so you have to make a file in hard copy for lab record. Also make a folder to your N-Drive and save your work there.

Problem 1 Write a program that asks the user for a letter from the alphabet and then prints out the next character in the alphabet. Take account of both upper and lower case characters, and if the user enters 'z' or 'Z' then return 'a' or 'A', respectively. The program will loop continuously, until the user indicates the program should terminate. A sample run of the program follows.

Hi! I'm a clever computer program that knows the alphabet.
Please enter a letter:
c
The next letter is d.
Do you want to enter another letter (y = yes)?
y
Please enter a letter:
D
The next letter is E.
Do you want to enter another letter (y = yes)?
y
Please enter a letter:
z

The next letter is a.
Do you want to enter another letter (y = yes)?
n
Goodbye!

Problem 2. A computer program is required that reads positive integers, one per line, from the keyboard into a list. The user indicates that they are finished by entering any negative integer (the negative integer itself is not stored). The computer program then checks if any of the numbers in the list is the square root of any other number in the list. The program terminates after finding the first such number. Write this program using fixed-size arrays, the new and delete commands, and a loop to copy the elements from one array to another.

Code to create an array of length len
   int * templist;
   templist = new int[len];

Code to delete an array
   delete [] templist;

Sample runs of the program:

If the list is (13, 3, 4, 9, 12) then the program should return
   the number 9 has a square root of 3 in the list.
If the list is (13, 3, 4, 10, 12) then the program should return
   No square roots found in the list.

Problem 3 A computer program is required that reads single letters, one per line, from the keyboard into a list. The user indicates they are finished by entering a '%' character (the '%' itself is not stored). The computer program then checks if any of the letters, anywhere in the list, appear next to each other alphabetically. The program terminates after finding the first such pair of letters. Write this program using fixed-size arrays, the new and delete commands, and a loop to copy the elements from one array to another.

Code to create an array of length len
   int * templist;
   templist = new int[len];
Code to delete an array
   delete [] templist;

Sample runs of the program:

If the list is (z, d, f, c, r) then the program should return
   Letters d and c appear next to each other alphabetically.
If the list is (z, d, f, b, r) then the program should return
   No letters appear next to each other alphabetically.