

Introduction to Programming (CS-200)

Lab 3

Note:

- 1- Make sure to submit the lab by the end time on lms. Any late submissions will not be entertained.
- 2- Make sure that your lab has been checked by the TA before the end of the lab.
- 3- Any **cheating case** will be reported to **Disciplinary Committee** without any delay.

Problem 1 (25 Marks):

You need to implement a simple encryption technique. This was used in World War

The enemy might intercept your messages so you need to make sure that they might just intercept your message but they cannot understand your message.

For that, you simply need to shift every character by 5 places. For example, if you have a char "a" it should become "f". Do this in a function. **Also, you need to make a separate function for decryption.** It simply does the exact opposite of what the encryption function does. It shifts back every character by 5 places. For your simplicity, you should use only lower-case alphabets.

Example:

Encryption, a string like

"ali" becomes "fqn".

"home" becomes "mtrj"

"secret code" becomes "xjhwjy htij"

and vice versa for decryption.

Things to look out for:

You need to make sure that if the character becomes greater than 'z', the next character must be 'a'. Similarly, a character less than 'a' shifts to 'z'.

You also need to make sure that the spaces remain as spaces in a complete sentence.

You can add an integer to a character. Try it out for yourself and see what happens.

Problem 2:

Create a structure "Date" with following member variable

int Month

int Day

int Year

- Write a function to print the Date in DD:MM:YYYY format.
- Write a function to add two "Date" objects.
- Write a function to subtract one Date from another.

for simplicity assume every month is of 30 days and make sure that number of days should not exceed 30 and number of months should not exceed 12.

Problem 3 (50 marks):

GPA Calculator

Create a structure called “**semester**” with the following details as variables within it.

Credits (int)

Grade points(int)

Create a class “**Student**” should have following PRIVATE data members:

name(string)

major(string)

semester[8] (array of structures)

Class “Students” should have following Public members functions:

1. **Constructor with no input**
2. **Over-ridden constructor taking input as name and major**
3. **A function that calculates the CGPA of students.**