EE1102 Introduction to Programming **Assignment 5-B**

Total Marks: 70
Due Date and Time: March 5, 2021 6 pm. **No late submission will be permitted.**
Submission Procedure: Upload the C program files by the due date and time. The files should be named as specified in each problem statement. Replace ROLLNO with your roll number (all small letters). **Do not upload exe files.**

Problem 1. Write a C program called ROLLNO_average_marks.c that will take as input marks of students in a course and prints out the average. The number of students in the course can vary. So you have to do the following: (1) take as input the number of students in the class, (2) use malloc to create the space required to save the marks of the students, (2) get the marks of the students as input from the user, (3) compute the average mark of the class, (4) print the result with a meaningful message, and (5) free the space allocated earlier to store marks before return.

Marks: 15

Problem 2. Write a C program called ROLLNO_encrypt_string.c that will take as input a string and generate a new encrypted string using the following rules:

(a) if a character is an alphabet, its case is changed, i.e., uppercase letter is changed to lowercase letter and lowercase letter is changed to uppercase letter,
(b) if a character is a digit in the range '0' to '9', it is changed to be a character 9 minus the digit. For example, if the character is '5', it is changed to '4'.
(c) if the character is '+', '-', '*', or '/', change '+' to '/', '-' to '*', '*' to '-', and '/' to '+',
(d) if the character is a space, change it to '$'
(e) if the character is a '$', change it to space
(f) any other character is saved as it is, and
(g) after the above conversion for each character in the string, the entire string is reversed.

Sample run:

```
Enter the string to convert: EXAM +2$over
Encrypted string : REVO 7/$maxe
```

Marks: 25

Problem 3. Write a C program called ROLLNO_user_menu.c that provides the user with the following menu and asks the user to enter an integer as input to select which action to perform. Based on the input, the required action should be performed. After performing the action, the menu should again be displayed and the user input should be asked. This process should be repeated till the user input is 0. When an invalid input is provided, an error message should be printed and the user input should again be asked.

User Menu:

```
1 : Factorial
2 : Square
3 : Cube
0 : Exit
```

When the user input is 1, the user should be asked to enter a positive integer less than 10. The factorial of the number should be computed if the input is valid and printed. If the input is not valid, an error message should be printed.

When the user input is 2, the user should be asked to enter an integer. The square of the number should be computed and printed.

When the user input is 3, the user should be asked to enter an integer. The cube of the number should be computed and printed.

When the user input is 0, you should exit out of the program.

Marks: 25

Problem 4. Follow good programming practice such as documenting with meaningful comments, using meaningful names for variables, and formatting the program. TAs will evaluate if you followed good programming practice in your code and if you printed the results of the above programs in an understandable format.

Marks: 5