



University of Vavuniya

First Examination in Information Technology - 2022

First Semester - January/February - 2024

IT1134 - Fundamentals of Programming (Practical)

Answer all questions

Time Allowed: Three hours

Instructions:

You are requested to create a folder on your desktop with your index number (eg: ITXXXX) and save all your files in that folder.

$$F = C \times \frac{9}{5} + 32$$

$\begin{aligned} & 5^{\circ}C \\ & 5 \times \frac{9}{5} + 32 \\ & 9 + 32 \\ & = 41 \end{aligned}$

1. Write the C++ program to implement the following double functions.

(a) Function **Celsius** returns the Celsius equivalent of a Fahrenheit temperature. $C = \frac{5}{9}(F - 32) + 273$

(b) Function **Fahrenheit** returns the Fahrenheit equivalent of a Celsius temperature.

Use the above functions to write a main function that prints Tables showing the Fahrenheit equivalents of all Celsius temperatures from 1 to 100 degrees and the Celsius equivalents of all Fahrenheit temperatures from 32 to 212 degrees. [20%]

2. Write a C++ program to declare a structure for a student record consisting of the following fields:

RegNo //Registration Number

$$(C \times \frac{9}{5}) + 32 = F$$

Name //Name with initial

$$C = \frac{5}{9}(F - 32)$$

$$C = (F - 32) \times \frac{5}{9}$$

Marks1 //First assessment marks

Marks2 //Second assessment marks

Total //Total of two assessments marks

Avg //Average of two assessments marks

Write a program to keep records for five students using functions to do the following tasks:

- (a) Read the student's data.
- (b) Calculate the total marks and average for each student.
- (c) Display the students' details.
- (d) Print the Registration Number, Total marks and Average marks for all students, sorted in descending order based on their Total marks.

[30%]

3. Develop a C++ program for a basic banking system that manages bank accounts. The program employs a structure called **BankAccount** to represent each account, storing information such as the account number and the current balance. The program offers the following functionalities:

A. Account Creation:

- (a) Users are prompted to choose option '1' from the menu to create a new bank account.
- (b) Upon selection, users are prompted to enter a unique account number for the new account.
- (c) The program checks if the entered account number already exists. If it does, the system notifies the user that duplicate accounts are not allowed, and no new account is created.
- (d) If the account number is unique and there is space for a new account (maximum accounts not reached), a new account is created with the entered account number and an initial balance of zero.

- (e) Users receive a confirmation message indicating that the account creation was successful.

B. Deposit Feature:

- (a) Users can choose option '2' from the menu to deposit funds into an existing bank account.
- (b) The program prompts the user to enter the account number for the deposit.
- (c) It then checks if the specified account exists. If found, users are prompted to enter the amount they wish to deposit.
- (d) The program updates the account's balance by adding the deposit amount.
- (e) Users receive a confirmation message indicating that the deposit was successful, along with the updated balance.

C. Withdrawal Feature:

- (a) Users can select option '3' from the menu to withdraw funds from an existing bank account.
- (b) The program prompts the user to enter the account number for the withdrawal.
- (c) It checks if the specified account exists. If found, users are prompted to enter the amount they wish to withdraw.
- (d) The program verifies if there are sufficient funds in the account for the withdrawal. If yes, it updates the account's balance by subtracting the withdrawal amount.
- (e) If there are insufficient funds, the system notifies the user of the issue.
- (f) Users receive a confirmation message indicating whether the withdrawal was successful, along with the updated balance if applicable.

D. Balance Display:

- (a) Users can choose option '4' from the menu to check the current balance of an existing bank account.

- (b) The program prompts the user to enter the account number for which they want to view the balance.
- (c) It checks if the specified account exists. If found, the program displays the current balance of the account.
- (d) If the account is not found, the system notifies the user that the account does not exist.

The program employs a menu-driven approach, allowing users to perform these actions iteratively until they choose to exit by selecting option '0'. The user interface is designed to be clear and user-friendly, providing feedback on the outcomes of each action. Error messages are displayed to guide users in case of invalid inputs, duplicate accounts, or insufficient funds.

[50%]

Sample output:

=====Banking System Menu=====

- 1. Create Account
- 2. Deposit
- 3. Withdraw
- 4. Display Balance
- 0. Exit

Enter your choice: 1

Enter account number: 1001

Account created successfully.

=====Banking System Menu=====

- 1. Create Account
- 2. Deposit
- 3. Withdraw
- 4. Display Balance
- 0. Exit

Enter your choice: 2

Enter account number: 1001

Enter deposit amount: 2000

Deposit successful. New balance: 2000

=====Banking System Menu=====

1. Create Account
2. Deposit
3. Withdraw
4. Display Balance
0. Exit

Enter your choice: 4

Enter account number: 1001

Account balance: 2000

=====Banking System Menu=====

1. Create Account
2. Deposit
3. Withdraw
4. Display Balance
0. Exit

Enter your choice: 3

Enter account number: 1001

Enter withdrawal amount: 3000

Insufficient funds.

=====Banking System Menu=====

1. Create Account
2. Deposit
3. Withdraw
4. Display Balance
0. Exit

Enter your choice: 3

Enter account number: 1001

Enter withdrawal amount: 1000

Withdrawal successful. New balance: 1000

=====Banking System Menu=====

1. Create Account

2. Deposit

3. Withdraw

4. Display Balance

0. Exit

Enter your choice: 4

Enter account number: 1002

Account not found.

=====Banking System Menu=====

1. Create Account

2. Deposit

3. Withdraw

4. Display Balance

0. Exit

Enter your choice: 0

Exiting the program. Goodbye!