National University of Computer and Emerging Sciences, Lahore Campus

	Course:	**Programming Fundamentals**	**Course Code:**	**CS-1002**
	Program:	**BS(Computer Science)**	**Semester:**	**Fall-2022**
	Due Date:	**19 Nov 2022** **Assignment_2**	**Total Marks:**	**60**

Instruction/Notes:

Task#1:

(a) Write a program that declares a 1D static integer array and get the input from user. Your task is to determine the equilibrium index of the array. As discussed in the class, sum of values on the left of equilibrium index should be equal to the sum of values on the right side. Input values should be in the range (-5000 to 5000).

(b) Now prompt the user to enter an integer (say k) in the range (1 to size). Your task to print the kth largest element in the array.

Task#2:   **ATM MACHINE**

In this assignment you will create a program, in C++, that allows a user to do the following:

MAIN MENU

1) Create a bank account by supplying a User ID (NOT password).
2) Login using their ID - ONLY.
3) Quit the program.

Now if login was successful the user will be able to do the following:

OPERATIONS MENU

1) Withdraw money.
2) Deposit money.
3) Request balance.
4) Go back to Main Menu.

If login was not successful (for example, the User ID did not match) then the user will be taken back to the main menu.

Rules

1. A user ID can only comprise of positive integers, **from 1 – 10 ONLY**. So **only 10 accounts** should be created and maintained. The record of accounts must be maintained in an array.

2. When you are creating a User ID, it should not comprise of non-integer pattern such as characters, special/alpha-numeric characters and/or string values. If a user enters a non-numeric User ID, during account creation, system should display an error message and ask User ID again.

3. Login should only prompt for user ID. Not password.

4. If a User ID exists, the user should be able to login and see the OPERATIONS MENU. Otherwise, keep going back to MAIN MENU.

5. Initial BALANCE for each account should be 0.

6. For the choice below, post successful login

   Withdraw money:

   - The ATM system should only take numeric value. System should prompt an error if a character, string or an alpha-numeric character is entered. System should as again for the Deposit Amount until a correct value is entered.

   - Note that the ATM system can only dispense currency notes that are available e.g. 5000, 1000, 500, 100, 50, 20 and 10). So system should not accept withdrawal amounts such as 5542, 308 etc. System should ask again for the Deposit Amount until a correct value is entered.

   - For the amount of withdrawal needed, since this is not a real ATM, you should display on the screen
     - Currency note denomination(s) & Number of note for each denomination dispatched e.g. if 550.00 is entered by the user for withdrawal, the message on the screen be like

         "Cash Withdrawal for Rs. 545 requested
         a. Denomination 100s – 5

         b. Denominations 20s – 2

         c. Denominations 10s – 1

   - System should not accept any values for change e.g., 350.42. As the ATM cannot dispense change/coins. So the user should only be able to enter values like 300.00, 560.00 etc. System should ask again for the Deposit Amount until a correct value is entered.

   - System should not dispense money more than the current account balance.

7. For the choice below, post successful login

   Deposit money:

   - The ATM system should only accept numeric values (both integer and decimal). System should display an error if a character, string or an alpha-numeric character is entered. System should ask again for the Deposit Amount until a correct value is entered.

   - A user should be able to deposit change e.g. 5988.81 is a valid deposit amount.

8. DO NOT use any C++ built-in functions.

This is what your program in action will look like:

Hi! Welcome to Mr. (Your name)'s ATM Machine!

Please select an option from the menu below:

l -> Login

c -> Create New Account

q -> Quit

> l (Selected option)

Please enter your user id: **6**

******** Account Does not Exist !!! ********

Please select an option from the menu below:

l -> Login

c -> Create New Account

q -> Quit

> **c   (Selected option)**

Please enter your user name: **1**

Thank You! Your account has been created!

Please select an option from the menu below:

l -> Login

c -> Create New Account

q -> Quit

> **l (Selected option)**

Please enter your user id: **1**

Access Granted!

d   -> Deposit Money

w -> Withdraw Money

r -> Request Balance

m -> Go back to Main Screen.

> **d (option selected)**

Enter Amount of deposit:

>**Rs. 1000**

Amount credited successfully

d   -> Deposit Money

w -> Withdraw Money

r -> Request Balance

m -> Go back to Main Screen.

> **r**

Your balance is RS.1000.

d   -> Deposit Money

w -> Withdraw Money

r -> Request Balance

m -> Go back to Main Screen.

> **w**

Amount of withdrawal:

> **500**

Cash Withdrawal for Rs. 500 requested

Denomination 100s – 5

d   -> Deposit Money

w -> Withdraw Money

r -> Request Balance

m -> Go back to Main Screen.

> **r**

Your balance is Rs. 500.54

d -> Deposit Money

w -> Withdraw Money

r -> Request Balance

m -> Go back to Main Screen.

> **m**

l -> Login

c -> Create New Account

q -> Quit

>q

Display – "Thanks for stopping by <u>User **1**</u>! BYE"

When the user press ENTER, the system goes back to Main Menu and the user can start all over again.