

Function

QUESTION # 1

Your task is to create a C program that performs password length validation and user authentication based on the given requirements below:

- a) Prompts the user to enter a password.
- b) Validates the entered password by checking if it is at least 8 characters long.
- c) If the password meets the length requirement, the program should compare it to a stored password "Secure123."
- d) If the entered password matches the stored password, display "Login successful. Welcome!" Otherwise, display "Login failed. Incorrect password."

QUESTION # 2

In this C program, you are tasked with creating a function called `decideCarUsage` that helps users decide whether they should use their car on a particular day of the week. Users provide the numeric part of their car's number and the day of the week (1 to 7). The program applies a simple rule: even-numbered cars should be used on even days, and odd-numbered cars on odd days. The function returns 1 if the car should be used and 0 if it should not.

QUESTION # 3

You are given an array of integers. Write a C program that defines a user-defined function `processArray` to calculate the sum, maximum, and minimum values in the array. The program should take the array and its size as parameters and use the function to compute these values.

Input:Array is [4, 8, 1, 15, 6]

Output:

Array Sum: 34

Maximum Value: 15

Minimum Value: 1

Pointer

Question _04:

Write a program that implements the SortFunction that takes argument pointer to an array, size of the array and the order in which it is going to be sort. Such as, 1 for Ascending order and 2 for Descending orde. Finally, print this array in Main() to check.

```
void SortFunction(int *arr, int *size, int order);
```

Question _05:

Write a program that takes N no of character in an array. Now you need to correct the array and convert it into the Sentence Case. To correct that, you need to pass that array to a function using pointer.

```
void SentenceCase(char *Text, int *size);
```

In the end you need to print the array in Main() to check.

Sentence Case: You capitalize just the first letter of the first word in sentence. The rest of the words and letters in the title should not be capitalized. Also the first letter after the fullstop(.)

Question _06:

Write a program that ask the user to enter the total 'N' no of characters in user's name {First Name + Last Name} to create a dynamic array of characters. After create a dynamic array of that 'N' no of characters using malloc or calloc function. Finally copy your full name in it that has already been taken from the user before

```
Dynamic Array = "Muhib Ahmed";
```

Filing

QUESTION # 7

Using C, create a file named budge.txt that contains three equal-length columns of numbers, like this:

```
-462.13 486.47 973.79
755.42 843.04 -963.67
442.58 -843.02 -462.86
-233.93 -821.67 399.59
-379.65 -556.37 837.46
55.18 -144.93 -93.15
533.73 804.64 -66.25
-922.12 914.68 -264.67
-600.27 -838.59 747.02
-962.97 49.96 -677.79
```

Now write a program named budget.c that reads this file and adds up the numbers in each column. The program's output should look like this:

Column sums are: -1774.16 -105.79 429.47

QUESTION # 8

Create a structure to store Student data. A student has RollNo, Name, Department, Batch, Section, CGPA. Store the information of N students using array and store it into a file. Then access the file to find out the following information:

- Given a user input of "RollNo", print all the data of that student on the screen.
- Loop through the array of students and only print the data of students who are in Batch 2022

QUESTION # 9

Write a C program to read an existing text file, and encrypt it and save the encrypted version in a new file according to the following rules:

1. Each vowel must be replaced by "vow" or "VOW". It should be lowercase if it is the 1st,3rd,5th vowel (odd num in the file (odd numbers) and uppercase if 2nd, 4th, 6th etc (even numbers).
2. Every 3 letter sequence of characters containing "s" must be replaced with PF-Lab.
3. After the above changes, use a normal shift cipher and replace every letter in the file with the letter which is 3 letter after. For example, A will be replaced by D, B replaced by E, Z replaced by C and so on.

Structure:

QUESTION # 10

.You are transporting some boxes through a tunnel, where each box is a parallelepiped, and is characterized by its length, width and height.

The height of the tunnel is 41 feet, and the width can be assumed to be infinite. A box can be carried through the tunnel only if its height is strictly less than the tunnel's height. Find the volume of each box that can be successfully transported to the other end of the tunnel. Note: Boxes cannot be rotated.

Sample Input 0

4

5 5 5

1 2 40

10 5 41

7 2 42

Sample Output 0

125

80

Explanation: The first box is low, only 5 feet tall, so it can pass through the tunnel and its volume is $5*5*5=125$. The second box is sufficiently low, its volume is $1*2*40=80$. The third box is exactly 41 feet tall so it cannot pass. The same can be said about the fourth box.

Note: Only use structs for this question

QUESTION # 11

You need to implement the following 2 struct.

```
struct Student{}; struct Register{};
```

Student contains attributes StudentId, FirstName, LastName, cellno, email.

Register contains the attributes CourseId, CourseName.

Now you need to inherit the Register struct in Student struct. It means that the student struct holds the variable of Register struct variable. After that you need to take input for 5 students and then print them

[Hint: Declare array of struct Student std[5]; for 5 students]