Programming Fundamentals (CL-1002)

Lab 09

Deadline: November 20, 2021 (02:00 PM After noon) (Submit on Google Classroom)

Points: 100

Instructions:

1. Solve each problem in separate file, Name the code file with problem no (Task_01, Task_02,.)
2. Copy these files (Task_01, Task_02,.) in a folder and name the folder like that K21XXXX. where XXXX is your 4-digit Student Id.
3. Now compress that folder using WinRAR software and submit on google-classroom.
4. Do not attach .exe file, otherwise it will show a threat or virus and not allow me to download.
5. Make sure you must Press the Turn-In button after uploading the solution folder. Otherwise, it will not be submitted.

Task_01:

Write a program that reads the numbers from user and store these numbers into an array of same size. Find and display the sum of all positive numbers and calculate the average.

Task_02:

Write a C program to read elements in a matrix and check whether matrix is Sparse matrix or not.

Logic: To check whether a matrix is sparse matrix we only need to check the total number of elements that are equal to zero. The matrix is sparse matrix if T ≥ ((m * n) / 2) where T defines total number of

$$\begin{bmatrix} 1 & 6 & 0 \\ 0 & 0 & 0 \\ 4 & 0 & 5 \end{bmatrix}$$

zero elements where m and n are rows and columns respectively.

Task_03:

Write a program which takes a matrix of any size as user input and returns the maximum element of matrix as output. Your code should also show the entered matrix on the screen.

Task_04:

You are given a dataset which contains five subject marks of two students.

For e.g. **std1_marks [] = {60,75,85,95,49}, std2_marks [] = {59,70,65,45,39}**.

You are asked to find the covariance among both student's marks. Formula for covariance is

$$\operatorname{cov}(X,Y) = \frac{1}{n}\sum_{i=1}^{n}(x_i - x')(y_i - y').$$

Task_05:

You taking a square matrix as input from keyboard and then you transpose the same matrix after meeting the requirements you are also interested to find out whether original Matrix A and transpose of Matrix A are equal are not. If the answer is yes, then you print the matrix along with message "matrix is symmetric" otherwise you print the "matrix is asymmetric".

Task_06:

Write down a program which asks user to input his first name and last name in a separate array. After taking the input your program should be able to concatenate first name and last name and return it as full name. count down number of characters in the full name as well.

For example:
First name: Iqbal
Second name: Choudhary

Full name: Iqbal Choudhary
Character Count: 14

Task_07:

You are working part time job along with your three friends after university time. All of you sell six different products per day. At end of duty time each of you submit a report which contains the information like employee id of each of you, the id of the product which you sold and the total amount for the products which you have sold. After one month of your job your reporting officer wants you to you write a program which read the report at end of the month and summarize the total sale made by each employee for each product. Your program should display the processed information in the form of table where each row will represent the respective product and each column will be the representation for each employee. Your program should also print the total product sale and the total sale by particular employee.

Task_08:

You need to declare an array of 5 x 9 elements. In which first 1st column contains the StudentID and its respective 5 courses obtained marks in following 5 five columns for the semester. In rest of 4 columns total marks, obtained marks, and Percentage as shown in given table.

- Initialize the array with its default value.
- You need to take user input for the first 6 columns.
- Total marks, obtained marks, and Percentage columns will be filled by your program on the basis of required logic for each of the columns.

Std-id	C1-Marks	C2-Marks	C3-Marks	C4-Marks	C5-Marks	Total-marks	Obt-marks	percentage
1								
2								
3								
4								
5								

Task_09:

you appeared for entry test at FAST-NU. Your test contains an IQ based part in which you IQ level is tested with following formula.

Iq_Score = 2 + (A + 0.5p).

You are required to write a program which generate a table for value of Iq_Score, A and p, where the values of variable A varies within range(1-to-7) and for each value of A, p value varies within range (4.5-to-13.5) in steps of 0.6.

Task_10:

FAST-NU enrolled more than 1200 students in undergrad program and planning to register more students in coming year. To achieve the objective, they are looking for nearby land to be purchased. They are able to find out the following 8 pieces of lands which are rectangle in shape.

```
//  Plot No.    Length   width
    1,          150.6,   126.9,
    2,          354,     451.51,
    3,          172.23,  75.65,
    4,          73.33,   707.17,
    5,          415.15,   116.17,
    6,          415.15,   116.17,
    7,          415.15,   116.17,
    8,          415.15,   116.17,
```

write down a program to find the out the area of land pieces and also determine which land is largest

Enjoy Coding