Lab Test 2

[Date: 3.3.2022 *Time: 9:30 AM – 12:00 PM, Max. Marks: 100*]

Write your Name, Roll Number, Address, Test-I-R (identity of this problem) in a header.

The test is open book, but you are strictly prohibited to communicate with any one in any form or copy from programs available externally during the lab test. If it is found, you will get zero in the test and -10 from the total.

Problem statement (write C-program):

Submit/upload your (i) C program, and (ii) output file.

Read the problem statement carefully.

Marks of students are tabulated in a table which can be stored in a 2-D array. In each row of the table first column contains the name of the student and in subsequent columns marks of subject-1 to subject-n are stored. An example of a table for marks of 3 students with 2 subjects are shown below:

Abhinav 25 40
Kader 45 35
Mary 36 49

The above table can be represented by a structure with the following form:

a) *student_no*, and *subject_no*
b) *student*: A 2D array of character capable of storing names of maximum 100 students where number of alphabets in a name cannot exceed 50.
c) *table*: A pointer to pointer to int data type for dynamic allocation of a 2D array of *student_no* x *subject_no*

For the above example the values in the corresponding structure are:
student_no=3 *subject_no*=2
Student array contains following strings:
Abhinav
Kader
Mary

The table of size 3x2 contains the marks as follows:
25 40
45 35
36 49

Write a program for defining a structure named _MARKS for representing the table as discussed above and also implement the following:

(i) ***allocate_array( ):*** A function to dynamically allocate a 2D int array of size MxN. This function is used for dynamic allocation of a 2-D array of *student_no* x *subject_no* to the pointer *table* of a structure of type _MARKS.

(ii) ***read_table(.)***: A function to read a table. It reads first *student_no* and *subject_no*, then allocates a 2-D array of integer of *student_no* x *subject_no* to *table,* and then reads data for a table.

(iii) ***print_table(.)*****:** Prints the content of a table in the form given in the example.

(iv) ***get_total_marks(.)*****:** Its input is a table of type _MARKS and output is also another table with additional column storing the total of marks obtained by a student in all the subjects..

Using above functions write a main function, which reads a table and computes another table containing the total marks. Finally, the program prints both input and output tables.

Run your program with the following data set and generate the output.

Input dataset:

(i) student_no = 8 subject_no = 5

Keiser 35 78 26 90 89
Suman 46 90 19 28 17
Amlan 80 65 23 56 83
Saroj 59 19 28 37 47
Amina 48 57 39 47 87
Gautam 87 47 67 12 29
Rafiq 65 39 48 52 79
Tapasi 87 73 82 91 65

(ii) student_no = 4 subject_no = 4

Anwesha 85 88 46 93
Barun 66 90 89 58
Anadi 80 55 33 76
Zinia 79 49 88 47