Question 1 :

Create a restaurant struct having Id, Name,Number of ratings and array of Ratings and average ratings.

Ratings should be integer array.

Your program should calculate the average rating for each restaurant in the *Output* function.

```
void input(Restaurant restaurants[], int size);
void output(Restaurant restaurants[], int size);
```

```
Enter number of restaurants: 2
Enter Id: 1
Enter Name: mac
Enter number of ratings: 5
Enter Ratings: 1 2 3 4 5
=======================================
Enter Id: 2
Enter Name: kfc
Enter number of ratings: 3
Enter Ratings: 1 2 3
=======================================
Output:
Restaurant Id: 1    Restaurant Name: mac    Restaurant Average Rating: 3
Restaurant Id: 2    Restaurant Name: kfc    Restaurant Average Rating: 2
```

Question 2 :

Write a C++ program which represents the player as a structure. Each player has name, 3 scores and total of his scores. Your program should ask the user to enter the number of players and then calculate the total scores of each one and finally display the player name with maximum score.

Sample run

```
Enter number of players : 3
Player # 1:
Name: Eman
Scores: 30 50 60
Player # 2:
Name: sara
Scores: 60 80 100
Player # 3:
Name: mohamed
Scores: 90 70 150
The player with maximum score is mohamed
```

Question 3 :

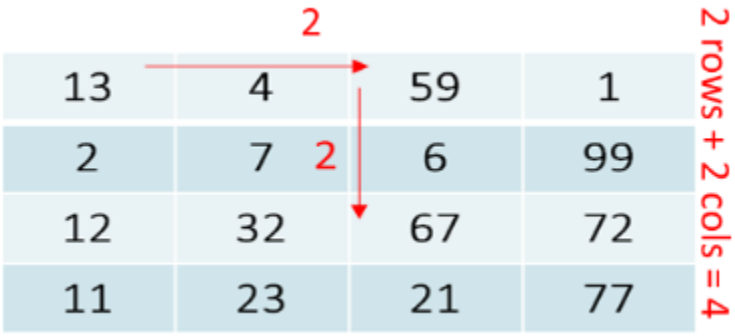
Write a program that swaps two rows in a matrix, the program should ask the user to enter the number of columns and rows in a 2D array. Then it asks to enter the two indices to swap the two rows. The array should be a dynamic array.

```
void input(int arr[][10], int rows, int cols);
       void output(int arr[][10], int rows, int cols);
```

```
Enter number of rows: 3
Enter number of cols: 3
Enter array:
1 2 3
4 5 6
7 8 9
Enter first row index: 1
Enter second row index: 2
Output array:
1     2     3
7     8     9
4     5     6
```

Question 4

Find path length between two elements
The user will be asked to enter the size of 2D array , and fill this array then the user will enter two existing numbers , the program will search for each one and get the position of their first occurrence then calculate the distance between them .
Note: distance: difference of rows + difference of cols



13	4	59	1
2	7	6	99
12	32	67	72
11	23	21	77

Use function :
Int GetElementLocation(int m[ ][10] , int rows , int cols , int num1 , int num2);

```
Enter matrix size ( rows , cols ) : 4 4
Enter the matrix :
13   4  59   1
 2   7   6  99
12  32  67  72
11  23  21  77
Enter two numbers : 13  67
The distance between them is : 4
```

Question 5

Write a program that takes the size of a 2-D arrays (size x size) max 10 x 10, enter their elements, and ask the user to select certain row to display the max , min and average of that row.

Use the following functions:

- input
- getMaxMinandAvg

Note: no global variables, output displayed in main

Sample Run:

Enter the size of the 2D array: **4 3**

Enter the array:

1 2 4

3 4 5

5 7 3

1 3 9

Select row: 3

Output:

Min: 3

Max: 7

Average: 5

Question 6 :

Write a **function "insert"** that takes a list of sorted numbers that are stored in an array and a number. Your program should insert the number in the sorted list and then display the list after inserting the number.
Hint: press -1 if your list is done. create your array with big size. Max size of array is 10

Sample Run
Enter sorted list:
12, 16, 20, 40, 50, 70, -1
Enter number:
26
List after insertion:
12, 16, 20, 26, 40, 50, 70

Question 7 :

Write a program that takes from the user **n** product dynamic array, each product has an ID, name and price and then ask the user the product name want to change and the new name. the program should display the products after the change.

The program uses the following functions:

- void input (product arr[],int n)
- void Replace(product arr[],int n, string oldName , String NewName)
- void display (product arr[],int n)

Note: max size of the array is 10

Sample Run :

Enter the number of products:**3**
Enter the ID : **124**
Enter the name : **Cover**
Enter the price: **50**
Enter the ID : **111**
Enter the name : **headset**
Enter the price: **40**
Enter the ID : **232**
Enter the name: **lamps**
Enter the price: **34**

Enter the name to change: **lamps**
Enter the new name: **led lamps**

The new products:

ID : **124**	name : **Cover**	price: **50**
ID : **111**	name : **headset**	price: **40**
ID : **232**	name: **led lamps**	price: **34**

Question 8 :

Write a program that takes the details of hotels (name, rating , pricePerNight) **in a array of structs**. Then sort the hotels by their rating descendingly and print a list of all hotels sorted
You should use the following functions :

- void input(hotel arr[] ,int size)
- void sort(hotel arr[], int size)
- void displayhotels(hotel arr [] , int size)

Note:- max size of the array is 10

Sample run:
Enter the number of hotels : **5**
Enter the hotels details:
Fairmont 4.0 350
InterContinental 4.5 500
Marriott 4.7 300
Novotel 3.5 250
Hilton 4.8 450

The list of hotels:
Hilton 4.8 450
Marriott 4.7 300
InterContinental 4.5 500
Fairmont 4.0 350
Novotel 3.5 250