Programming Fundamentals
Project 1

Note:

- *This is an individual Project.*
- *You have to perform only one question among the three.*
- *Each question carries equal marks.*
- *100 % marks will be given on the basis of No Memory leakage, No dangling pointers, and No extra space should be wasted. Also make use of helper functions where ever required.*
- *String data type not allowed instead use CString with null termination else you will get 0.*
- *Only Students without any plagiarism will be given a favor of 3 bonus marks in the project and in one of the instrument after mid in lab.*
- *Submission will be on portal in Lab under folder named Project_Submissions.*

Question 1: "Pestcouts" is an emerging pesticide (insect killer) research lab. They are aiming at producing environmental friendly pesticides. Currently they are conducting tests for a new formula on a farmhouse. They divided the farmhouse into 4 fields. They have conducted a test and record the success scores. Scores are sent to the system one by one and stored in a table as shown below.

In the below data table, tests are being conducted in 4 fields. Each field corresponds to row and each test value corresponds to column of data.

Field 1	5	1	21	-1	-1	-1
Field 2	-1	-1	-1	-1	-1	-1
Field 3	23	5	20	5	30	-1
Field 4	1	9	5	0	-1	-1

Note: -1 shows that field is empty.

1. Insert a new value in any field of table at first empty location.
2. Count the number of filled locations (values other than -1) in whole table
3. Delete any filled value from any field. (Deletion means replace with -1)
4. Find and display the top two values in whole data (excluding -1) which have maximum occurrences. For example, in given data table above, 5 has maximum occurrence of 4 times while 1 has second maximum occurrence of 2 times.
5. Calculate Average test score of all the field values (excluding empty locations).
6. Tell the field/s no having maximum success scores value

Expected Output 1:

- Press 1 to **insert new test result.**
- Press 2 to **display total number of results in table.**
- Press 3 to **delete any test value from table.**
- Press 4 to **display the 2 most frequent values in table.**
- Press 5 to **display average scores of each field.**
- Press 6 to **display field having maximum success score.**

- *Enter choice: 5*
  Field1 average: 9
  Field2 average: empty field
  Field3 average: 16.6
  Field4 average: 2.5

Expected Output 2:

- Press 1 to **insert new test result.**
- Press 2 to **display total number of results in table.**
- Press 3 to **delete any test value from table.**
- Press 4 to **display the 2 most frequent values in table.**
- Press 5 to **display average scores of each field.**
- Press 6 to **display field having maximum success score.**

- *Enter choice: 6*
  Field3 has the maximum success score.

Expected Output 3:

- Press 1 to **insert new test result.**
- Press 2 to **display total number of results in table.**
- Press 3 to **delete any test value from table.**
- Press 4 to **display the 2 most frequent values in table.**
- Press 5 to **display average scores of each field.**
- Press 6 to **display field having maximum success score.**

- *Enter choice: 2*
  There are 12 test score values entered in table.

Expected Output 4:

- *Press 1 to **insert new test result.***
- *Press 2 to **display total number of results in table.***
- *Press 3 to **delete any test value from table.***
- *Press 4 to **display the 2 most frequent values in table.***
- *Press 5 to **display average scores of each field.***
- *Press 6 to **display field having maximum success score.***

- *Enter choice: 1*
  Enter the field in which you want to enter a value: 1
  Enter the value you want to enter: 12

  12 is entered in field 1 at location 4

Field 1	5	1	21	12	-1	-1
Field 2	-1	-1	-1	-1	-1	-1
Field 3	23	5	20	5	30	-1
Field 4	1	9	5	0	-1	-1