Data Structure

Lab Exam (Mid-term)

Instructions:

- ➢ You have to solve three problems out of these given five problems.
- ➢ Answer any one Question in between Question 1, 2, 3.
- ➢ **Question 4 and Question 5 are compulsory to answer for all.**
- ➢ If you solve more problems within the given time then you will get bonus marks.

N.B. Remember to delete your downloaded question + source code from your PC before leaving the class. You are not allowed to see any kind of resources during lab exam (not even your class note)

Question 1:

Write a Program to Multiply Two Matrices by Passing Matrix to a Function.

Sample Case:

```
Enter rows and column for first matrix: 3 2

Enter rows and column for second matrix: 3 2

       Error! column of first matrix not equal to row of second.

Enter rows and column for first matrix: 2 3

Enter rows and column for second matrix: 3 2

       Enter elements of matrix 1:

              Enter elements a11: 3        Enter elements a12: -2

              Enter elements a13: 5        Enter elements a21: 3

              Enter elements a22: 0        Enter elements a23: 4

       Enter elements of matrix 2:

              Enter elements b11: 2        Enter elements b12: 3

              Enter elements b21: -9       Enter elements b22: 0

              Enter elements b31: 0        Enter elements b32: 4

       Result is:  Output Matrix:          24  29

                                           6  25
```

Question 2:

Write a program with a function named UpperRight, which will display the upper right triangle elements of a matrix.

Write a program which will take the sizes of the matrix (Row & Col) and elements of the matrix from the user and print the UpperRight elements.

Sample Input:	Sample Output:
1 2 3 4 5 6 7 8 9	1 2 3 5 6 9

Question 3:

Write a program to search a particular element from a 2D-array and print its position.

Sample Input:

Enter size of the array:

row-3, column-2

Enter elements of this array:

4 5
9 10
8 0

Value to be searched: 10

Sample Output:

Position: Row-1, column-1

Question 4:

Write a Program to test the binary search algorithm.

Sample Input:

Enter how many elements you want: 8

Enter the elements:

2 29 5 40 17 23 3 11

/** For Searching**/

Enter the item to search: 23

Sample Output:

23 found in position: 5

(If the specified number is not present in the array an error message should be displayed)

Question 5:

Write a Program to implement a linear array with some random (integer) value.

Sample case:

1. void array_input(); ///input data into array
2. void array_output(); ///traverse array data and display
3. void print_reverse(); ///to display the data in reverse order
4. void insert_end(); ///to insert a new item at the end of array
5. void insert_position(); ///to insert a new item at the specific position
6. void delete_end(); ///to delete the last data
7. void delete_x(); ///to delete an item x from the array
8. void delete_ position (); ///to delete a data of a specific position
9. void highest_lowest(); ///to find the highest and lowest data of an array
10. void count_data(); ///to count the total number of data of a particular time
11. void search_x(); ///to search an item x into the array (linear search)
12. Exit.

Enter your choice: Any choice in between 1 to 12 (User Input)

- **The program will show the output accordingly as per user's choice until it terminates (choice 12)**
- **Any choice not in between 1 to 12 will be considered as invalid choice. In this case ask the user for valid input again.**