The lecture notes are allowed during the assignemt. Student needs to comment in detail for all C code.

Question 1: (15 points)

Write a C program that calculate the length of a string which inputted by user (using the pointer). For example:

```
Input a string: Welcome to C Lab

The length of Welcome to C Lab is: 16
---------------------------------
```

Question 2: (15 points)

Write a C program that generate a N-element array with N integer numbers from user. Print the original array and print the sorted array in ascending order using bubble sort (sinking sort) and pointers. For example:

```
Array size: 10
Element[0] = 1
Element[1] = 3
Element[2] = 56
Element[3] = 4
Element[4] = 10
Element[5] = 4
Element[6] = 6
Element[7] = 8
Element[8] = 9
Element[9] = 7
The original array:
  1   3 56   4 10   4   6   8   9   7
The sorted array:
  1   3   4   4   6   7   8   9 10 56
```

Question 3: (15 points)

Write a C program that read through an array of any type using pointers. Write a C program to scan through this array to find the position of a particular value.

```
Enter a size of array: 6
Enter element a[0]: 1
Enter element a[1]: 5
Enter element a[2]: 4
Enter element a[3]: 8
Enter element a[4]: 9
Enter element a[5]: 7
1  5  4  8  9  7

Enter a search key: 5
The search key is in the position : 2
```

Question 4: (15 points)

Write a C program that generate a N-element array with random numbers from 1 to 50. Then the user will input 1 integer number within that range and the program should count how many times that number occurs in the array and then delete all elements equal to the input number from array. Student have to use pointer.

```
Enter array size (N>=100) 120
The original array
  47  35   5  17  41  36  46  23  22  34
  26  42  32  32  10   2  38  12  18  25
  25  14  22   9  20  39  25   6   4  39
  36   5   2   1   6  17  11  50  49  30
  10  19  18  28   9  13  26  18  23  21
  45  15  36  30   6  17  50  45  33  23
  43   9   7   2  10  21  41  12  40   8
  48  16  50  23  33  30   8  24   5  23
  11  11  40  30  19  32   4  13  13  23
  45  38  11  18  24  24  43   2   6  28
  18  28   3  14  35  28   5  33  36  24
  41  11  19   7  22   7  32  17   3  38
Enter a value (from 1 to 50) to be deleted = 7
The new array
  47  35   5  17  41  36  46  23  22  34
  26  42  32  32  10   2  38  12  18  25
  25  14  22   9  20  39  25   6   4  39
  36   5   2   1   6  17  11  50  49  30
  10  19  18  28   9  13  26  18  23  21
  45  15  36  30   6  17  50  45  33  23
  43   9   2  10  21  41  12  40   8  48
  16  50  23  33  30   8  24   5  23  11
  11  40  30  19  32   4  13  13  23  45
  38  11  18  24  24  43   2   6  28  18
  28   3  14  35  28   5  33  36  24  41
  11  19  22  32  17   3  38
There are 3 values of 7 being deleted from the original array
```

Question 5: (10 points)

Write a C program that read a person's information (last name, first name, age, nationality, height, weight, job tittle) and then print again using structure.

Question 6: (15 points)

Write a C program that ask user to choose 3 options, in which:

- Option 1: convert a hour format from hh.mm.ss to second

- Option 2: convert second to a hour format hh:mm:ss

- Option 3: add two times (hh:mm:ss)

Question 7: (15 points)

Create a structure Student with fields name, roll_number, and marks. Write a program that allows the user to input the data for 10 students, and create functions to:

- Print all students who scored more than a specified grade.

- Find the student with the highest marks.

End