Department of Software / Computer Engineering

SENG114 & CENG104 – Computer Programming II

Spring 2021 - 2022

Lab Guide #5 – Week 6

OBJECTIVE : String Operations, Usage of Binary Search
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1. Write the function **`longest`** that takes the string array and the number of words in the array as an input parameters, finds and returns the index of the **last longest word** in the array.

Write a C program that takes a several words from the user until the word "**STOP**" is entered, stores the words in the string array, finds the longest word in the array and displays the longest word and its length on the screen.

Example Run#1:

```
Enter a word (or STOP): biscuit
Enter a word (or STOP): coffee
Enter a word (or STOP): brownie
Enter a word (or STOP): beef
Enter a word (or STOP): bread
Enter a word (or STOP): STOP

Longest word:brownie
Length: 7
```

Project Name: LabGuide5_1
File Name: Question_1.cpp

2. Write a function named **findLastOcc()** that takes a sentence and a string to be searched as input parameters, finds and returns the index of the **last occurrence of the given string** in the sentence.

Write a C program that will read a sentence and a key string from the user, finds the LAST OCCURENCE of the given key string and displays the sentence back until the key string's last occurence.

Example Run #1:

```
Enter a sentence: do not go gentle into that gentle good night
Enter a key string: gentle
Result: do not go gentle into that
```

Example Run #2:

```
Enter a sentence: do not go gentle into that good night
Enter a key string: do
Result: That's an empty string, sorry..
```

Example Run #3:

```
Enter a sentece: rage against the dying of the light rage
Enter a key string: rage
Result: rage against the dying of the light
```

Project Name: LabGuide5_2
Source Name: Question_2.cpp

BUBBLE SORT ALGORITHM:

```
1. Repeat
2. Initialize sorted 1
   3. Repeat for each pair of adjacent array elements
   4. If the values in a pair are out of order
      4.1. Exchange the values
      4.2. Set sorted to 0
  as long as the array is not sorted
```

SELECTION SORT ALGORITHM:

```
1.For each value of fill from 0 to n – 1
2.Find index_of_min, the index of the smallest element in the unsorted sub array list[fill] through list[n-1].
3.If fill is not the position of the smallest element (index_of_min)
4.Exchange the smallest element with the one at position fill.
```

3. Write a C program that will get the points for several football teams from a file "**points.txt"** and:

a) Sort the points with selection sort algorithm in **ascending order** and display them on the screen.

Example Run:

```
Points
------
16
17
20
25
26
26
27
29
30
30
31
32
35
35
40
41
49
53
```

points.txt

```
41
40
35
26
30
17
16
29
53
49
27
26
35
32
31
30
25
20
```

Project_name: Labguide5_3a
File_name: Question_3a.cpp

b) Sort the points with bubble sort algorithm in **descending order** and display them on the screen.

Example Run:

```
Points
------
53
49
41
40
35
35
32
31
30
30
29
27
26
26
25
20
17
16
```

Project_name: Labguide5_3b
File_name: Question_3b.cpp

4. **a)** Write a C program that forms a Disco Song list by getting song names from the user until "end" is entered. Each song name will be added to the list and the list should be sorted in ascending order by using bubble sort algorithm. After sorting, the new form of the list will be displayed on the screen. Assume that NO duplicate value is given.

Project_name: Labguide5_4a
File_name: Question_4a.cpp

- **Example Run:**

```
Enter a song name (end to stop): Stanga
Enter a song name (end to stop): Bonbon
Enter a song name (end to stop): OMG
Enter a song name (end to stop): Rockabye
Enter a song name (end to stop): Habib Galbi
Enter a song name (end to stop): Just Say
Enter a song name (end to stop): But A Lie
Enter a song name (end to stop): Age of Emotions
Enter a song name (end to stop): end
```

```
Disco Songs
--------------------
1) Age of Emotions
2) Bonbon
3) But A Lie
4) Habib Galbi
5) Just Say
6) OMG
7) Rockabye
8) Stanga
```

b) modify the program **Question_4a.cpp,** so the list will be sorted in descending order by using bubble sort algorithm.

Project_name: Labguide5_4b
File_name: Question_4b.cpp

- **Example Run:**

```
Enter a song name (end to stop): Stanga
Enter a song name (end to stop): Bonbon
Enter a song name (end to stop): OMG
Enter a song name (end to stop): Rockabye
Enter a song name (end to stop): Habib Galbi
Enter a song name (end to stop): Just Say
Enter a song name (end to stop): But A Lie
Enter a song name (end to stop): Age of Emotions
Enter a song name (end to stop): end
```

```
Disco Songs
--------------------
1) Stanga
2) Rockabye
3) OMG
4) Just Say
5) Habib Galbi
6) But A Lie
7) Bonbon
8) Age of Emotions
```