Department of Information Systems and Technologies

CTIS 152 – Data Structures and Algorithms
Fall 2024 - 2025

Lab Guide #8 - Week 6-1

OBJECTIVE : String Library Functions
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<string.h> library functions are:

- `int strlen(const char *str)`
- `char *strcpy( char *dest, const char *src)`
- `char *strncpy(char *str1, const char *str2, size_t n)`
- `char *strcat( char *dest, const char *src)`
- `char * strncat ( char * destination, const char * source, size_t num );`
- `int strcmp(const char *str1, const char *str2)`
- `int strncmp(const char *str1, const char *str2, size_t n)`

Q1. Write a C program that reads several words from the user until "**END**" is entered, counts the number of words, converts the lowercase letters of each word into the uppercase form and generates a sentence with the given words. At the end, the program displays the number of words given and the sentence form of the words as in the example run.

Write the following function;

- **`convertToUpper`** that takes a string as parameter, converts all lowercase letters into the uppercase form without using any built-in functions.

➢ `int strlen( char *str)`
➢ `char *strcat( char *dest, char *src)`
➢ `int strcmp(char *str1, char *str2)`

Example Run#1:

```
Enter a word (or END to stop): we
Enter a word (or END to stop): remember
Enter a word (or END to stop): Prof.
Enter a word (or END to stop): Dogramaci
Enter a word (or END to stop): with
Enter a word (or END to stop): deep
Enter a word (or END to stop): respect.
Enter a word (or END to stop): END
You have entered 7 words

The sentence form in uppercase of the given words:
WE REMEMBER PROF. DOGRAMACI WITH DEEP RESPECT.
```

Project Name: LG08_Q1
File Name: Q1.cpp

Q2. Write a C program that reads the file named **“recipe.txt”** and finds how many words there are in each line of the paragraph. Display the line numbers and the number of words on each line as in the example run.

recipe.txt

```
Spicy Sesame Noodles With Chicken and Peanuts EOL
In this quick and spicy weeknight noodle dish, EOL
sizzling hot oil is poured over red-pepper flakes, EOL
orange peel, crunchy peanuts, soy sauce and sesame oil. EOL
While you brown the ground chicken, the mixture sits, EOL
and the flavors become more pronounced and fiery. EOL
Tossed with soft noodles and browned chicken, EOL
the bright chile-peanut oil shines. If you crave something green, EOL
throw in a quick-cooking green vegetable when you break up the chicken in Step 3. EOL
You can also swap the chicken with ground pork or beef, or crumbled tofu. EOL
```

HINT: Each line end with “EOL”, means end of line as you can see in your text files.

Example Run:

```
 1. line contains 7 words
 2. line contains 8 words
 3. line contains 8 words
 4. line contains 9 words
 5. line contains 9 words
 6. line contains 8 words
 7. line contains 7 words
 8. line contains 10 words
 9. line contains 15 words
10. line contains 14 words
```

Project Name: LG08_Q2
File Name: Q2.cpp

Q3. Write a C program that takes several words from the user until the word “**END**” is entered, stores the words in the string array, finds the last shortest word in the array and displays it and its length on the screen.

Write the following function;

- **shortest:** takes the string array and the number of words in the array as input parameters, finds and returns the index of the last **shortest word** in the array.

Example Run#1:

```
Enter a word (or END): Mumbai
Enter a word (or END): Paris
Enter a word (or END): Rome
Enter a word (or END): Tokyo
Enter a word (or END): Bali
Enter a word (or END): Sydney
Enter a word (or END): END
Shortest word: Bali
Length: 4
```

Example Run#2:

```
Enter a word (or END): Phenomenal
Enter a word (or END): Nostalgia
Enter a word (or END): Harmony
Enter a word (or END): Radiant
Enter a word (or END): Serenity
Enter a word (or END): END
Shortest word: Radiant
Length: 7
```

Project Name: LG08_Q3
File Name: Q3.cpp

Additional Questions

AQ.

Write a C program that reads a list of course codes (department name and the numeric code of the course) from a file named **course.txt**, converts course codes into optic codes, and displays both as in the example run. Define the necessary structure and make use of the following structure array.

```
codes_t codeList[MAX] = { {"CS","11"}, {"THM","61"}, {"CTIS","62"},
                        {"ECON","32"}, {"HIST","94"}, {"TURK","95"} };
```

Write the folloıwing function;

- **searchCrs**: that gets the code list and the code to be searched as parameters, searches for the given department code in the array, and returns the index of it. If the dept is not in the list returns -1.

Project Name: LG08_AQ
File Name: AQ.cpp

Example Run:

```
CTIS 165 -> 62165
THM  106 -> 61106
HIST 200 -> 94200
CTIS 221 -> 62221
TURK 102 -> 95102
CS   101 -> 11101
ECON 103 -> 32103
TMH  105 -> ERROR
HIST 209 -> 94209
```

course.txt

```
CTIS 165
THM 106
HIST 200
CTIS 221
TURK 102
CS 101
ECON 103
TMH 105
HIST 209
```