

Problem Set 1 Purpose: Introduction to character arrays, null termination, user input and displaying array, using C-String standard C++ library, writing program using strlen, strcpy etc

Problem 1: Write a function MyOwnStrlen whose parameter is a null terminated character array. The function finds and returns the length of this array.

Problem 2: Write a function MyOwnStrcmp whose parameters are two null terminated character arrays. The function returns true if both arrays are identical and false otherwise. Use MyOwnStrlen written in part 1 to find the length of both arrays.

Problem 3: Write a function charCount whose parameters are a null terminated character array and a character. The function returns the number of times this character is found in the character array. Implement a driver program (main) to test these functions.

Problem 4: Write a function strcat whose parameters are three arrays. Array1 and array2 have a fixed size. Concatenate both these arrays into array3. (You can use functions MyOwnStrlen written in inlab, if needed.)

Problem 5: Write a function findsubstr whose parameters are 2 null terminated character arrays. The function returns true if array2 exists in array1 and false otherwise.

Problem 6: Write a function countwords whose parameters are 2 arrays. The function returns the number of times array2 exists in array1. (You can use function in pl task 2, if you want.)

Problem 7: Note: All the arrays (input/output) are declared in the caller (main or any other function) then pass them as parameters in function.

a) Declare a character string of size 50 and initialize all items of the array to zero:
`const int MAXSIZE = 50;`
`char str[MAXSIZE] = {0};`

1. Now input the string using:

`cin >> str;` //(When running the programming specify *"hello this is my ITC lab "* as input string.)

What do you get when you output the string using `cout`? (`cout << str`)

Repeat the same for different strings that contain spaces. What are your observations?

2. Run a for loop and output all the 50 characters of the string as numbers (Using `cout << (int) str[i]`)? What do you observe?

3. Try this instead of simple `cin`:

`cin.getline(str, MAXSIZE);`

Now output the string using `cout` and output individual characters of the string using the above mentioned for loop. What do you observe?

4. Next reduce the allocated size of the string to 5 (`MAXSIZE=5`) and in the `getline` function input more than 5 characters. What are your observations?

b) Write a function to find the length of a string (find actual number of characters in the given string). What parameters are required by this function?

NOTE: Remember you can pass the maximum size of the array allocated for storing characters (optional) but this won't be the actual size of the string.

For example:
Input string: "I love programming"

String Size: 18

- c) Write a function that takes as parameters a string (char array), a 'find' character and a 'replace' character. The function should replace all the occurrences of the 'find' character with the 'replace' character.

For example:
string: "I love programming"

find character: 'm'
replace character: 'n'
Output String : "I love progranning"

- d) Write a function that takes as input only a character array (again do not specify the size of the string). The function should replace the string so that all leading spaces are removed.

Input String: " hello how are you?"

Output String: "hello how are you?"

- e) Write a function (refined version of find and replace) that replaces a substring with another substring and creates a new string. Now the function prototype changes to:

void findAndReplace(char originalStr[],char findStr[],char replaceStr[], char newStr[])

Sample Input/Output:

OriginalStr = "this lab is amazing and fascinating"
findStr = "ing"
replaceStr = "es me"
then the function should construct the new string as:
"this lab is amazes me and fascinates me"

Problem 8: Write a function "GetStringLenght" which takes a string and returns its length. For example:

String: "I love programming."

Length: 19

Problem 9: Write a function that takes as parameters a string (char array), a 'find' character and a 'replace' character. The function should replace all the occurrences of the 'find' character with the 'replace' character. For example:

string: "I love programming"

find character: 'm'

replace character: 'n'

then the string should become "I love progranning"

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char arr[25] = { 'a', 'g', 'T', '@', '5', 'h', '%', '1', 'k', 'R', 'B', '7', '&', 'l', 'V', 'j', '#', 'n', 'Q', '3', '!', ')', '}', 'W', 'y' };
```

Write a program that converts the upper case letters to lower case letters and lower case letters to upper case letters. The numbers should be replaced with $N + 5$, where N is the number. If this number exceeds single digit, replace it with the unit digit of that number. Other characters should remain as they are. Display the altered array.

