Bangladesh University of Engineering and Technology
Department of Computer Science and Engineering
CSE102: Structured Programming Language Sessional
July 2023 Semester

Offline 4 (Dynamic Memory Allocation)

Deadline: 11:55 PM, 9 February, 2024

Last Modified: 7:00 PM, 05 January, 2024

Please see the attached `string_torkenizer.c` file. You have to just complete the necessary function mentioned below in the same file and submit it.

You will implement the *strtok* function from the string library and print the tokens . More specifically,

1. You will write a function *_strTokenize* that has two parameters: a string and a character. You have to tokenize the string by the character delimiter and return the array of tokens. The prototype of the function will be,

   ```
   char **_strTokenize(char *str, char delim);
   ```

2. You will write a function *_printTokens* that will print the tokens separated by newline. The prototype will be,

   ```
   void _printTokens(char **tokens);
   ```

3. You will write a function *_printTokensUnique* that will print only the tokens that were not printed early. The prototype will be,

   ```
   void _printTokensUnique(char **tokens);
   ```

4. You will write a function *_freeTokens* that will free the memory allocated to tokens. The prototype will be,
   `void _freeTokens(char **tokens);`

Example of a tokenization:

Suppose the string is “abracadabra” and the delimiter is ‘a’,
then the _strtokenize will return the array {“br”, “c”, “d”, “br”}.

the array will be passed to *_printTokens* and *_printTokensUnique.* Their corresponding output in the cmd will be

_printTokens	*_printTokensUnique*
br c d br	br c d

Input:

In the first line there will be an integer and a character. The integer is the length of the string and the character is the delimiter.
In the second line there will be a string containing only lowercase English letters.

Sample IO:

Input	Output
11 a abracadabra	The tokens are: br c d br The unique tokens are: br c d
11 b abracadabra	The tokens are: a racada ra The unique tokens are: a racada ra
5 b abbba	The tokens are: a a The unique tokens are: a

Constraints:

1. To access an element you can't use array indexing with [] operator. For example, arr[1] can't be used. One way can be,

    ```
    ++arr;
    *arr;
    ```

    In other words, your code mustn't contain any third bracket [].
2. You have to use dynamic memory allocation for each array you use and free them when they are no longer needed. While allocating memory, be careful to efficiently allocate the memory.
    Please first calculate the amount of memory required and then allocate just the needed amount. Allocation of a constant big amount of memory will result in a penalty.
3. You are not allowed to change the function prototypes or change the code that is written previously. You can't include any other header file (e.g. string).

Submission Guidelines

- Create a folder that is named after your 7-digit student ID.
- Place updated string_tokenizer.c inside the folder, and then zip that folder.
- Submit the zipped file in Moodle.

In case of any confusion please mail me at kowshic@teacher.cse.buet.ac.bd.