

HACETTEPE UNIVERSITY
DEPARTMENT OF COMPUTER ENGINEERING BBM203



Name : Mehmet Taha

Surname : Usta

Number : 21527472

E~mail : b21527472@cs.hacettepe.edu.tr

Subject : Trie

Programming Language : C

1. Problem Definition

Design a Login System with Character Tree. Practice on the tree data structure.

2. Methods and Solution

Firstly, input file opens, output file generated. Read the input file to determine the last line. The rewind code is called to read the input file again. Empty trie structure is created. The actual process starts by calling the `readfile_and_output()` function. The `readfile_and_output()` function starts to read the input file line by line. “\n” at the end of each line is deleted. The line is divided by spaces with `strtok()` function. if the first word equals -a, user added to trie with `insert` function. if the first word equals -s, the user is searched in trie with the `search` function. Password is returned if user is found. Error is returned if user isn’t found. if the first word equals -q, the user is searched in trie with the `search` function. password is returned if user is found. Error is returned if user isn’t found. if the password is correct, user logs in. if the password isn’t correct, program gives error. if the first word equals -d, the user is searched in trie with the `search` function. Password is returned if user is found. Error is returned if user isn’t found. If the password is returned, the user is deleted. If the password isn’t returned, program gives error. if the first word equals -l, `display()` function display the content of Trie. Results are printed to the output file while the file is being processed. The program is ended using the `free` and `fclose` functions.

3. Functions Implemented and not Implemented

`Fopen()` = Function is used to open a file to perform operations such as reading, writing etc.

`rewind()` = sets the file position to the beginning of the file of the given stream.

`Typedef struct{}` = Defines a physically grouped list of variables to be placed under one name in a block of memory, allowing the different variables to be accessed via a single pointer, or the struct declared name which returns the same address

`Malloc()`=Allocates the requested memory and returns a pointer to it.

`Readfile_and_output()` = Function to reads input file, processes according to input file,creates output file and saves the results to the output file

`While()` = loop in C programming repeatedly executes a target statement as long as a given condition is true.

`Fgets()` = Function is used to read a file line by line.

`Strlen()` = Computes the length of the string `str` up to, but not including the terminating null character.

`Strtok()` = Breaks string `str` into a series of tokens using the delimiter `delim`.

`For()` = A for loop is a repetition control structure that allows you to efficiently write a loop that needs to execute a specific number of times.

`Fprintf()` = Function writes string into a file pointed by `fp`.

`Strcmp()` = If two strings are same then `strcmp()` returns 0

`give_error()` = Function to prints error according to the result if input is not available

`removeTrie()` = Recursive function to delete a key from given Trie

isEmpty() = Returns true if root has no children, else false

display() = Function to display the content of Trie

isLeafNode () = function to check if current node is leaf node or not

search() = Returns true if key presents in trie, else mtu,mtu2,false

check() = Returns true if key presents in trie, else NULL

insert() = If not present, inserts key into trie. If the key is prefix of trie node, just marks leaf node

getNode() = Returns new trie node (initialized to NULLs)

Free() = Deallocates the memory previously allocated by a call to calloc, malloc, or realloc.

Fclose() = Function closes the file that is being pointed by file pointer fp

Makefile : Makefiles are a simple way to organize code compilation.