COSC 2436 lab1: Recursion

1. Introduction

You will create a C++ program to check if a string exists in a given matrix of characters using recursion. Your program will read input files contain a matrix of characters and the string to be searched. Output `true` if the string can be constructed from characters in the matrix, and `false` otherwise.

The string can be constructed from a sequence of character of adjacent index, where adjacent index are connected horizontally or vertically.

For this first lab, you will be given the cpp file (lab1.cpp) to work on. You can modify the given cpp file or make your own cpp file, anything work as long as your output is correct. Make sure you only have 1 cpp file with the main() function in your working directory, otherwise the script will not pass.

2. Input files

- The first line of the input will contain two integer ‘m’ and ‘n’, separated by a single space. Given ‘m’ represents the number of rows, and ‘n’ represents the number of columns in the matrix.
- The following ‘m’ lines will each contain ‘n’ number of characters, each character will be separated by a single space.
- The last line in the input will contain the string to be searched in the matrix.
- Each character in the given string is unique, meaning that a character will appear only once within the string.
- All character and string in the input will be in lowercase, there will be no extra lines and whitespaces in the input.

3. Output files

- Output “`true`” if the string exists in the matrix, and “`false`” otherwise.

4. Examples

input1.txt

```
5 5
m h j f n
r j e u l
y p l w b
a p f t j
r i s v z
apple
```

output1.txt

```
true
```

input2.txt

```
4 4
a y u n
o b j k
g i d w
p h c q
abc
```

output2.txt

```
false
```

input3.txt

```
7 10
c v c o e o i l j q
w q f a b e g k c q
v d a v i c l t a u
e c w m o c t s p i
m l s p u a c z n j
i t a b t k t y i n
c l v r e h t p p y
computer
```

output3.txt

```
true
```

5. Turn in your lab assignment

Lab 1 needs to be turned in to our Linux server, follow the link here
https://rizk.netlify.app/courses/cosc2430/2_resources/

Make sure to create a folder under your root directory, name it “lab1” (case sensitive), copy all your .cpp and .h file to this folder, “ArgumentManager.h” need to be included as well.

PS: This document may have typos, if you think something illogical, please email TAs for confirmation.