

CS1020E | Lab 3 | Exercise 2

Finding Words

Objective

The objective of this exercise is to learn how to use the `string` class.

Problem Description

You subscribed to a local newspaper that has a weekly puzzle. In the puzzle, you are given a $R \times C$ matrix with each cell consists of a single lowercase alphabet letter. In the matrix, adjacent characters may form words when read in the following directions:

- Horizontally
 - from left to the right, or
 - from right to the left
- Vertically
 - from top to the bottom, or
 - from bottom to the top
- Diagonally
 - from top-left to the bottom-right, or
 - from top-right to the bottom-left, or
 - from bottom-left to the top-right, or
 - from bottom-right to the top-left

In the puzzle, you are also given N words. You have to determine whether each word exists in the matrix. You think that this puzzle is too hard for you, especially when the size of the matrix is big. Therefore, you decide to write a program that can helps you.

Add your code to the given skeleton. **You MUST use a `string` object to store each row of the given matrix and each of the given words.** You are free to use any method in the `string` class. For details of the `string` class, please refer to

<http://www.cplusplus.com/reference/string/string/>
http://en.cppreference.com/w/cpp/string/basic_string

Inputs

The first line consists of two integers separated by a single space. They represent R and C respectively.

The next R lines contain the matrix, where each line has C characters.

The next line consists of a single integer representing N .

The next N lines, each consists of a string that represents a query word.

N is between 1 and 100 inclusive.

R and C are between 1 and 100 inclusive.

Each word in the query consists of only lowercase alphabet and has length between 1 and 100 characters inclusive.

Outputs

For each query, you have to output "YES" (without quote) if the query word exists in the matrix, or "NO" (without quote) otherwise.

Sample Run

```
7 8
xassddqs
gzccdsxu
jonathan
daczzzzt
wplofeee
cadddemc
aweqaedk
6
jonathan
kde
gnu
gocode
sunteck
cstentwenty
YES
YES
NO
YES
YES
NO
```

(User inputs are shown in **red**.)

Submission

You need to submit only your completed **findwords.cpp** to CodeCrunch (<https://codecrunch.comp.nus.edu.sg/>) before the specified deadline. We will take only your latest submission.

Late submissions will not be accepted. The submission system in CodeCrunch will automatically close at the deadline.