



r/programming

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1

I didn't get paid, so I open sourced my clients project

Tech



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1.7k



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# Competitive Programming

Lec 9  
Strings

Outstanding move

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# String

- Array of character  
Ex. “competitive programming”
- String as input.

For C++,

```
string s;  
cin >> s;
```

- s.max\_size()  
max\_size: 4294967291

For python,

```
s = str(input())
```

# C++ STL

<code>s.clear()</code>	To clear string s.	<a href="#">Link</a>
<code>s1.compare(s2)</code>	Return 0 if they are equal	<a href="#">Link</a>
<code>s.empty()</code>	Return true if length is 0	<a href="#">Link</a>
<code>s.erase(s.begin() + 9)</code>	Remove 10th character	<a href="#">Link</a>
<code>s1.find(s2)</code>	If s2 exist, return starting position of s2	<a href="#">Link</a>
<code>s1.insert(4, s2)</code>	Insert s2 string from 4th index in s1	<a href="#">Link</a>

# C++ STL

s.length() or s.size()	Return Length of string	<a href="#">Link</a>
S += "YES"	It will add string "YES" to S	<a href="#">Link</a>
s = s1 + s2;	Add two string and assign to new string.	<a href="#">Link</a>
s.push_back('a'); s.pop_back();	same as vector	<a href="#">Link</a>
s.substr(x, y);	Return new string X = starting position Y = length	<a href="#">Link</a>
s.replace() s.reverse(s.begin(), s.end())		<a href="#">Link</a> <a href="#">Link</a>

# Palindromic substrings

Chef likes strings a lot but he likes palindromic strings more. Today, Chef has two strings A and B, each consisting of lower case alphabets.

Chef is eager to know whether it is possible to choose some non empty strings s1 and s2 where s1 is a substring of A, s2 is a substring of B such that s1 + s2 is a palindromic string. Here '+' denotes the concatenation between the strings.

Constraints $1 \leq T \leq 10$ $1 \leq  A ,  B  \leq 1000$	Subtasks Subtask 1: $1 \leq  A ,  B  \leq 10$ : ( 40 pts ) Subtask 2: $1 \leq  A ,  B  \leq 1000$ : ( 60 pts )
Input 2 abc abc a b	Output Yes No

# Longest Common Prefix

Given the array of strings A,  
you need to find the longest string S which is the prefix of ALL the strings in the array.

Longest common prefix for a pair of strings S1 and S2 is the longest string S which is the prefix of both S1 and S2.

Input 1:

A = ["abcdefgh", "aefghijk", "abcefgh"]

Output 1:

"a"

Input 2:

A = ["abab", "ab", "abcd"];

Output 2:

"ab"

# Ants and Anteaters

You are given a grid with  $R$  rows (numbered 1 through  $R$ ) and  $C$  columns (numbered 1 through  $C$ ). Initially, each cell of this grid is either empty, contains an ant or an anteater. Each ant is moving in a fixed direction: up, down, left or right. The anteaters do not move.

The movement of ants happens in discrete steps. For example, when an ant is in the cell in the  $i$ -th row and  $j$ -th column at some point in time (in some step) and it is moving down, then in the next step, it enters the cell in the  $(i+1)$ -th row and  $j$ -th column. Two ants meet each other when they enter the same cell at the same point in time (in the same step). When ants meet, they do not interact in any way and keep moving in their fixed directions.

If an ant reaches an anteater, that anteater eats the ant, so the ant completely disappears. If an ant attempts to leave the grid, it also disappears. When two ants enter a cell containing an anteater at the same time, they are eaten before they could meet.

Calculate the total number of pairs of ants that meet each other.

# Ants and Anteaters

The first line of the input contains a single integer  $T$  denoting the number of test cases. The description of  $T$  test cases follows.

The first line of each test case contains two space-separated integers  $R$  and  $C$ .

Each of the following  $R$  lines contains a single string with length  $C$ . For each valid  $i, j$ , the  $j$ -th character in the  $i$ -th string is:

'#' if the cell in the  $i$ -th row and  $j$ -th column of the grid contains an anteater

'U', 'D', 'L' or 'R' if this cell contains an ant moving up, down, left or right respectively

'-' if this cell is empty



# Ants and Anteaters

Input: 1 3 3 R-- --- --U	Output: _____	Input: 1 4 R--R	Output: _____
Input: 1 3 3 R-D -#- R-U	Output: _____	Input 1 3 3 -D- R-L -U-	Output: _____

# Ants and Anteaters

Input: 1 3 3 R-- --- --U	Output: 1	Input: 1 4 R--R	Output: 0
Input: 1 3 3 R-D -#- R-U	Output: 2	Input 1 3 3 -D- R-L -U-	Output: 6

# Important String Algorithms

Find pattern in text string.

ex . text = "aabaabbbbaaabba"

Pattern = "aab"

Two algorithms,

1. KMP string matching
2. Z - Algo for string matching

Both gives all occurrences in linear time.

# Homework

<a href="#"><u>Getting Milk Tea</u></a>	Easy	Codechef
<a href="#"><u>Count And Say</u></a>	Medium	Interviewbit
<a href="#"><u>Integer to Roman</u></a>	Easy	Interviewbit
<a href="#"><u>Justified Text</u></a>	Hard	Interviewbit, Google
<a href="#"><u>Pretty Json</u></a>	Hard	Interviewbit, facebook, microsoft
<a href="#"><u>Suffix Structures</u></a>	Easy	Codeforces