

CS302 Final Exam, December 5, 2011 - James S. Plank

Answer all questions. Put your answers on the answer sheet.

Question 1: Programming Warm-Up

You are planning a small trek over at the local mountain range. It will involve walking for several days and spending the nights in a tent. The mountains are not very friendly (they're steep and rocky), and therefore many locations are not suitable for setting up a camp. You will be given a string **trail** which represents the locations in the order in which you are visiting them. **trail[i]** is '.' if it's possible to camp at the i-th location, and '^' otherwise.

You have several alternative plans to follow, given in the vector <string> **plans**. **plans[i][j]** is lowercase 'w' if according to the i-th plan you are going to walk through location j, and uppercase 'C' if you are going to camp there. A plan is invalid if it involves camping at a location that's not suitable for it.

Given **trail** and **plans** return the minimum number of nights that must be spent in the mountains, according to one of the valid **plans**. If all **plans** are invalid, return -1.

Definition

Class: Trekking

Method: findCamps

Parameters: string, vector <string>

Returns: int

Method signature: int findCamps(string trail, vector <string> plans)

Constraints

- **trail** will contain between 2 and 50 characters, inclusive.
- **trail** will contain only the characters '.' and '^'.
- **plans** will contain between 2 and 50 elements, inclusive.
- Each element of **plans** will contain the same number of characters as trail.
- Each element of **plans** will contain only the characters 'w' and 'C'.

EXAMPLES

Example 0:

- **trail** = "^..^....^..^.."
- **plans** = {"CwwCwwCwwCww", "wwwCwCwwwCww", "wwwwwwCwwwCww"}
- Returns: 2: The first plan is not valid because it involves camping in the first visited location, which is not suitable for camping. The other two plans are valid, but the third involves only two camps, so it's the best one.

Example 1:

- **trail** = "^^^^"
- **plans** = {"www", "wwwC" }
- Returns: 0

Example 2:

- **trail** = "^..^...."
- **plans** = {"wwCwwwC", "wwwCwww", "wCwwwCw"}
- Returns: -1

Example 3:

- **trail** = "^^^^....^..^.."
- **plans** = {"wwwwwwCwwwCwCwC", "wwwwwwCwwCwCwwwC", "wwwCwwwCwwwCww", "wwwwwwCwwwCwwwC"}
- Returns: 3

Example 4:

- **trail** = "....."
- **plans** = {"CwCwCwCwCwCwCw", "CwwCwwCwwCwwCw"}
- Returns: 5

Do not bother with include files or the class definition. Just implement the method.