

3104 Shortest find Path

In Unix, a file may be referred to by its absolute pathname which indicates the complete path of the file beginning from the main directory denoted by `'/'` called the root. For example, the absolute pathname `/tmp/alpha/one` refers to a file called `one` under the `alpha` directory, which in turn is under the `tmp` directory, which in turn is under the root directory (denoted by the first `'/'`). In this case, the file `one` may refer to either an actual file or another directory; the reason being that a directory in Unix is also considered a file and is not marked in any special way.

Based on a given absolute pathname, therefore, one can come up with the file hierarchy of a given filesystem. Consider the following set of absolute pathnames:

```
/tmp/alpha/a1
/tmp/alpha/a2
/tmp/beta
/tmp/gamma/c1
/tmp/gamma/c2
```

Based on the above listed absolute pathnames, one can identify that from the root `'/'`, there is one file called `tmp` (a directory) under which there are three files `alpha` (a directory), `beta` (may or may not be a directory) and `gamma` (a directory). Under the `alpha` directory are two files called `a1` and `a2`. Under the `gamma` directory are two files called `c1` and `c2`.

Unix system administrators use the `find` command to search the file hierarchy for a file starting from a specified absolute pathname. `find` recursively searches from the specified absolute pathname and any subdirectories from it.

Consider again the file hierarchy defined by the set of absolute pathnames above.

- All the files in this hierarchy may be specified with a single `find` starting from `/`.
- All the files under the `tmp` directory can be specified with a single `find` starting from `/tmp`.
- But all files excluding the `beta` file will need multiple `find` commands at different starting points; specifically, `find` commands starting from `/tmp/alpha` and from `/tmp/gamma`. Of course, enumerating all the files as starting point will also work but is not desired.

Input

The input file may be composed of multiple test cases.

Each test case begins with a list of absolute pathnames identifying a file hierarchy. One line contains exactly one absolute filename. Absolute pathnames do not repeat within the list and are not specified in any particular order.

The file hierarchy list is terminated by a line containing a single exclamation mark.

A list of 0 or more absolute pathnames to be searched follows. If a filename referring to a directory is specified, all files under that directory should also be included.

Each test case is terminated by two exclamation marks on a single line. The end of the file is indicated by three exclamation marks.

Filenames used in the absolute pathnames may contain the characters `'A'..'Z'`, `'a'..'z'`, `'0'..'9'`, `'_'` (underscore), `'.'` (period) and will not include spaces or other punctuation marks.

A path has a maximum depth of 32.

Output

Give the least number of starting points (absolute pathnames) for the *find* command that will match the specified set of absolute filenames without including unnecessary files. Filenames and directories should be printed on one line, separated by a single space, and sorted alphabetically.

Do not print leading or trailing spaces.

Sample Input

```
/a/b/c
/a/b/d/e
/a/b/d/f
/a/d
/b/c
!
/a/b/c
/a/b/d
/b
!!
/disc2/f3/f3a
/disc1
/disc2/f1
/disc2/f2
!
/disc2/f3/f3a
!!
!!!
```

Sample Output

```
/a/b /b
/disc2/f3/f3a
```