**Tower from blocks**

Little Johnny wants to build a tower of blocks. The tower must have a base (which is the right block) and a clock (another block) at the top. The tower must be solid - each two blocks must be connected as much as possible. Johnny is afraid of heights, so the tower must be as low as possible.  
The blocks have mounting surfaces in 24 different types. Mounting type „a” only fits to mounting type „a”. Each block has many such fasteners and can be described as their sequence. For example, to the block:

aabcbaacaac

we can join:

aacaacuvw

I the following way:

aabcbaacaac

aacaacuvw

or in this way:

aabcbaacaac

aacaacuvw

(If Johnny has a choice, he will always choose the second, more solid way).

The blocks can not be rotated. Block:  
aabbcc  
it's not the same as:  
ccbbaa

**Inpunt**

The total number of blocks will be given at the Input. Then, in the following lines, descriptions of blocks will appear in the form of a sequence of small letters of the English alphabet. The first block describes the base and always starts with the letter p (it will not appear in any other block). The second blanket is a clock, it always ends with a letter z (also it will not go in any other block). The other blocks are also strings of letters. Each link (each letter) has the height of one level.

**Out**

Write out the height of the tower (the number of its levels), or 0 if it can not be built.

**Example**

**Input**

5

paabaac

aadaabz

aacaaaaaaaaaaaaaaaaaaad

aacaaeaae

aaeaaeaad

**Out**

20