

An *edit step* is a transformation from one word x to another word y such that x and y are words in the dictionary, and x can be transformed to y by adding, deleting, or changing one letter. So the transformation from *dig* to *dog* or from *dog* to *do* are both edit steps. An *edit step ladder* is a lexicographically ordered sequence of words w_1, w_2, \dots, w_n such that the transformation from w_i to w_{i+1} is an edit step for all i from 1 to $n - 1$.

For a given dictionary, you are to compute the length of the longest edit step ladder.

Input

The input to your program consists of the dictionary – a set of lower case words in lexicographic order – one per line. No word exceeds 16 letters and there are no more than 25000 words in the dictionary.

Output

The output consists of a single integer, the number of words in the longest edit step ladder.

Sample Input

```
cat
dig
dog
fig
fin
fine
fog
log
wine
```

Sample Output

5