



Romanian Master of Informatics

4th Edition, Bucharest, 20th -23rd October 2016

Frequent

An astrobiologist studies life on the planet Alphabet. Life here is DNA-based and there are 26 nucleotides. Consequently, the DNA of a life form from Alphabet can be represented as a string of lowercase letters of the Latin alphabet. The astrobiologist has sequenced the DNA of K life forms, not necessarily distinct, with a total length of N nucleotides. Now she would like to find strands (substrings) of DNA that occur frequently among these life forms. Let $L(i)$ be the length of the longest strand of consecutive DNA nucleotides common to at least i life forms, for $2 \leq i \leq K$. Note that $L(i)$ can be 0.

Task

Help the astrobiologist compute the array L .

Input data

The file **frequent.in** contains an integer number on the first line, K , representing the number of life forms. Each of the following K lines contains a non-empty string of lowercase letters, terminated by a newline character.

Output data

The file **frequent.out** must contain $K - 1$ lines with the values $L(2)$, $L(3)$, ..., $L(K)$, each on its own line.

Limits and constraints

- $2 \leq N \leq 200,000$
- $2 \leq K \leq N$
- Time limit: 0.5 seconds
- Memory limit: 128 MB

Subtasks

Test cases will be scored **individually**.

Subtask	Percentage of test cases	Additional input constraints
1	30%	$N \leq 10,000$
2	40%	$N \leq 100,000$
3	30%	none



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Example

frequent.in	frequent.out	Explanation
6	5	<i>atter</i> appears in two of the strings
matter	3	<i>mat</i> appears in three of the strings
animate	2	<i>ma</i> (or <i>at</i> or <i>te</i>) appear in four of the strings
pattern	2	<i>ma</i> appears in five of the strings
thermal	1	<i>a</i> appears in all the strings
domain		
teammate		