

Text Messaging App (texts)

Paolo and Filippo run into a bit of trouble while working on a new text messaging application. Basically, when users type a message there are often some extra characters that don't belong to any meaningful words in their dictionary.

For this reason they decided to build a feature to help clean up these messages by breaking the string into valid words found in their built-in dictionary. Of course, there may be some leftover characters that don't form valid words, but Paolo and Filippo want to minimize these leftover characters as much as possible.

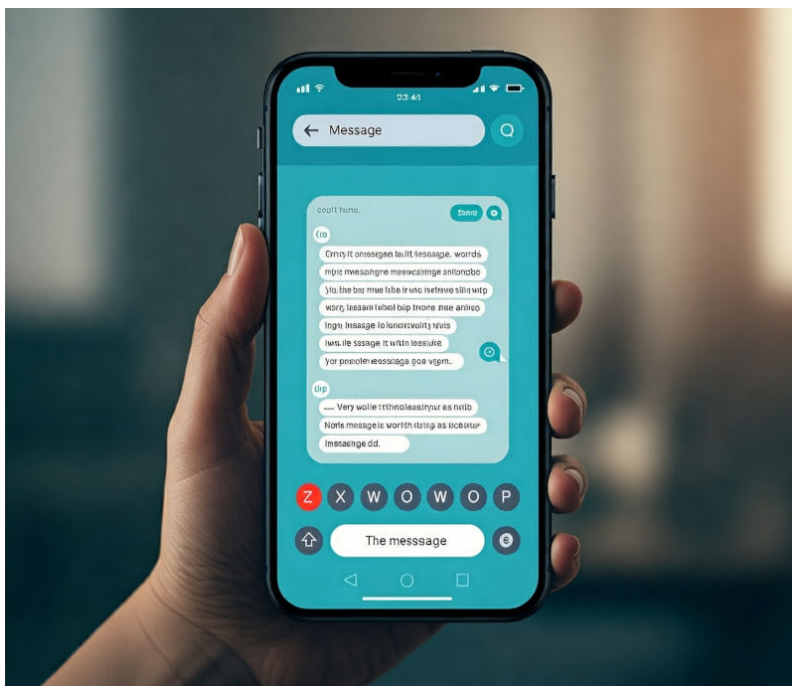


Figure 1: Example usage of the app, with the extra characters.

Given a string S representing the user's message and a dictionary of valid words, Paolo and Filippo need your help to break S into one or more non-overlapping substrings, such that each substring is a valid word from the dictionary. Each word may appear zero or multiple times in the message. If there are any characters that can't be used to form valid words, they should be counted as extra characters.

Your goal is to find the minimum number of extra characters left over after breaking the string optimally.

Input

The first line contains one string S , the user's message.

The second line contains an integer N , the number of words in the app's built-in dictionary.

Each of the following N lines contains one string W_i , the i -th word in the dictionary.

Output

You need to write a single line containing an integer, the minimum number of extra characters left over after breaking the string optimally.

Constraints

- $1 \leq |S| \leq 10^5$ where $|S|$ is the length of S , in characters.
- $0 \leq N \leq 10^5$.
- $1 \leq |W_i| \leq 10^5$.
- The sum of all $|W_i|$ is at most 10^6 .
- S and W_i consist of only lowercase English letters.
- $W_i \neq W_j$ for each i, j .

Examples

input	output
<pre>itacpcuniversity 3 itacpc university itacpcuniversity</pre>	1
<pre>hiiguysshowareyouuuu 10 am are guys hello hi how is me show you</pre>	4