

514. Freedom Trail

Difficulty : Hard

<https://leetcode.com/problems/freedom-trail>

In the video game Fallout 4, the quest **"Road to Freedom"** requires players to reach a metal dial called the **"Freedom Trail Ring"** and use the dial to spell a specific keyword to open the door.

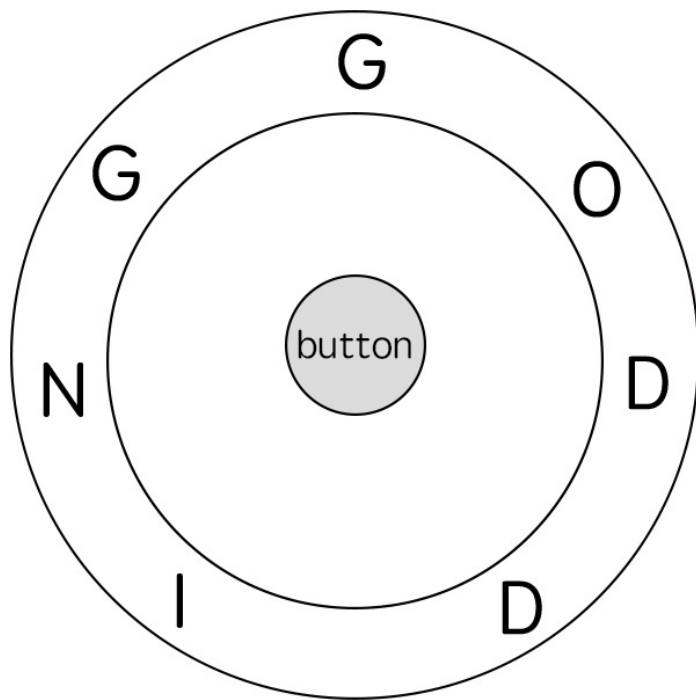
Given a string `ring` that represents the code engraved on the outer ring and another string `key` that represents the keyword that needs to be spelled, return *the minimum number of steps to spell all the characters in the keyword*.

Initially, the first character of the ring is aligned at the "12:00" direction. You should spell all the characters in `key` one by one by rotating `ring` clockwise or anticlockwise to make each character of the string `key` aligned at the "12:00" direction and then by pressing the center button.

At the stage of rotating the ring to spell the key character `key[i]`:

1. You can rotate the ring clockwise or anticlockwise by one place, which counts as **one step**. The final purpose of the rotation is to align one of `ring`'s characters at the "12:00" direction, where this character must equal `key[i]`.
2. If the character `key[i]` has been aligned at the "12:00" direction, press the center button to spell, which also counts as **one step**. After the pressing, you could begin to spell the next character in the key (next stage). Otherwise, you have finished all the spelling.

Example 1:



Input: `ring = "godding", key = "gd"`

Output: 4

Explanation:

For the first key character 'g', since it is already in place, we just need 1 step to spell this character.

For the second key character 'd', we need to rotate the ring "godding" anticlockwise by two steps to make it become "ddinggo". Also, we need 1 more step for spelling.

So the final output is 4.

Example 2:

Input: `ring = "godding", key = "godding"`

Output: 13

Constraints:

- $1 \leq \text{ring.length}, \text{key.length} \leq 100$
- `ring` and `key` consist of only lower case English letters.
- It is guaranteed that `key` could always be spelled by rotating `ring`.