In English, we have a concept called root, which can be followed by some other words to form another longer word - let's call this word successor. For example, the root an, followed by other, which can form another word another.

Now, given a dictionary consisting of many roots and a sentence. You need to replace all the successor in the sentence with the root forming it. If a successor has many roots can form it, replace it with the root with the shortest length.

You need to output the sentence after the replacement.

**Example 1:**

**Input:** dict = ["cat", "bat", "rat"]

sentence = "the cattle was rattled by the battery"

**Output:** "the cat was rat by the bat"

**Note:**

1. The input will only have lower-case letters.
2. 1 <= dict words number <= 1000
3. 1 <= sentence words number <= 1000
4. 1 <= root length <= 100
5. 1 <= sentence words length <= 1000