

# 1858. Longest Word With All Prefixes Premium

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Given an array of strings `words`, find the **longest** string in `words` such that **every prefix** of it is also in `words`.

- For example, let `words = ["a", "app", "ap"]`. The string `"app"` has prefixes `"ap"` and `"a"`, all of which are in `words`.

Return the string described above. If there is more than one string with the same length, return the **lexicographically smallest** one, and if no string exists, return `""`.

### Example 1:

**Input:** `words = ["k","ki","kir","kira", "kiran"]`  
**Output:** `"kiran"`  
**Explanation:** `"kiran"` has prefixes `"kira"`, `"kir"`, `"ki"`, and `"k"`, and all of them appear in `words`.

### Example 2:

**Input:** `words = ["a", "banana", "app", "appl", "ap", "apply", "apple"]`  
**Output:** `"apple"`  
**Explanation:** Both `"apple"` and `"apply"` have all their prefixes in `words`. However, `"apple"` is lexicographically smaller, so we return that.

### Example 3:

**Input:** `words = ["abc", "bc", "ab", "qwe"]`  
**Output:** `""`

### Constraints:

- $1 \leq words.length \leq 10^5$
- $1 \leq words[i].length \leq 10^5$
- $1 \leq \sum(words[i].length) \leq 10^5$
- `words[i]` consists only of lowercase English letters.

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Yes No

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Hint 1

Add all the words to a trie.

Hint 2

Check the longest path where all the nodes are words.

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