642. Design Search Autocomplete System Premium

Hard Topics Companies

Design a search autocomplete system for a search engine. Users may input a sentence (at least one word and end with a special character `'#'`).

You are given a string array `sentences` and an integer array `times` both of length `n` where `sentences[i]` is a previously typed sentence and `times[i]` is the corresponding number of times the sentence was typed. For each input character except `'#'`, return the top `3` historical hot sentences that have the same prefix as the part of the sentence already typed.

Here are the specific rules:

- The hot degree for a sentence is defined as the number of times a user typed the exactly same sentence before.
- The returned top `3` hot sentences should be sorted by hot degree (The first is the hottest one). If several sentences have the same hot degree, use ASCII-code order (smaller one appears first).
- If less than `3` hot sentences exist, return as many as you can.
- When the input is a special character, it means the sentence ends, and in this case, you need to return an empty list.

Implement the `AutocompleteSystem` class:

- `AutocompleteSystem(String[] sentences, int[] times)` Initializes the object with the `sentences` and `times` arrays.
- `List<String> input(char c)` This indicates that the user typed the character `c`.
  - Returns an empty array `[]` if `c == '#'` and stores the inputted sentence in the system.
  - Returns the top `3` historical hot sentences that have the same prefix as the part of the sentence already typed. If there are fewer than `3` matches, return them all.

Example 1:

> **Input**
> `["AutocompleteSystem", "input", "input", "input", "input"]`
> `[[["i love you", "island", "iroman", "i love leetcode"], [5, 3, 2, 2]], ["i"], [" "], ["a"], ["#"]]`
> **Output**
> `[null, ["i love you", "island", "i love leetcode"], ["i love you", "i love leetcode"], [], []]`
>
> **Explanation**
> `AutocompleteSystem obj = new AutocompleteSystem(["i love you", "island", "iroman", "i love leetcode"], [5, 3, 2, 2]);`
> `obj.input("i"); // return ["i love you", "island", "i love leetcode"]. There are four sentences that have prefix "i". Among them, "ironman" and "i love leetcode" have same hot degree. Since ' ' has ASCII code 32 and 'r' has ASCII code 114, "i love leetcode" should be in front of "ironman". Also we only need to output top 3 hot sentences, so "ironman" will be ignored.`
> `obj.input(" "); // return ["i love you", "i love leetcode"]. There are only two sentences that have prefix "i ".`
> `obj.input("a"); // return []. There are no sentences that have prefix "i a".`
> `obj.input("#"); // return []. The user finished the input, the sentence "i a" should be saved as a historical sentence in system. And the following input will be counted as a new search.`

Constraints:

- `n == sentences.length`
- `n == times.length`
- `1 <= n <= 100`
- `1 <= sentences[i].length <= 100`
- `1 <= times[i] <= 50`
- `c` is a lowercase English letter, a hash `'#'`, or space `' '`.
- Each tested sentence will be a sequence of characters `c` that end with the character `'#'`.
- Each tested sentence will have a length in the range `[1, 200]`.
- The words in each input sentence are separated by single spaces.
- At most `5000` calls will be made to `input`.

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