**Word Break II:**

Given a **non-empty** string *s* and a dictionary *wordDict* containing a list of **non-empty** words, add spaces in *s* to construct a sentence where each word is a valid dictionary word. Return all such possible sentences.

**Note:**

* The same word in the dictionary may be reused multiple times in the segmentation.
* You may assume the dictionary does not contain duplicate words.

**Example 1:**

**Input:**

s = "catsanddog"

wordDict = ["cat", "cats", "and", "sand", "dog"]

**Output:**

[

  "cats and dog",

  "cat sand dog"

]

**Example 2:**

**Input:**

s = "pineapplepenapple"

wordDict = ["apple", "pen", "applepen", "pine", "pineapple"]

**Output:**

[

  "pine apple pen apple",

  "pineapple pen apple",

  "pine applepen apple"

]

**Explanation:** Note that you are allowed to reuse a dictionary word.

**Example 3:**

**Input:**

s = "catsandog"

wordDict = ["cats", "dog", "sand", "and", "cat"]

**Output:**

[]