

Word Pattern

For this problem we must check if the given pattern and string s form a bijection (one-to-one mapping) between characters and words.

Key Idea:

- Split s into words by spaces.
- Check if each character in pattern consistently maps to the same word and vice versa.
- Ensure bijection:
 - Each character maps to exactly one word.
 - Each word maps to exactly one character.

Algorithm:

1. Split s by spaces \rightarrow get vector of words.
2. If $\text{pattern.size}() \neq \text{words.size}() \rightarrow$ return false.
3. Use two hash maps:
 - char \rightarrow Word: map pattern character \rightarrow word
 - word \rightarrow Char: map word \rightarrow pattern character
4. Iterate:
 - If mapping exists, check consistency.
 - If not, create new mapping.
5. If any mismatch \rightarrow return false, else return true.

Complexity:

- Time: $O(n)$ (n = number of words or pattern length)
- Space: $O(n)$ for two maps.