



Data Structures & Algorithms

Hashing-II



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Counting

- Counting is a very common pattern with hash maps.
- By "counting", we are referring to tracking the frequency of things.
- This means our hash map will be mapping keys to integers.
- Anytime you need to count anything, think about using a hash map to do it.

Counting

- Recall that when we were looking at sliding windows, some problems had their constraint as limiting the amount of a certain element in the window.

Example

- For example, longest substring with at most k 0s. In those problems, we could simply use an integer variable `curr` because we are only focused on one element (we only cared about 0).
- A hash map opens the door to solving problems where the constraint involves multiple elements.

Example 1

- You are given a string `s` and an integer `k`. Find the length of the longest substring that contains at most `k` distinct characters.
- For example, given `s = "eceba"` and `k = 2`, return 3. The longest substring with at most 2 distinct characters is "ece".

Example

- Input
 - $s = \text{"eceba"}$
 - $k = 2$
- Output
 - 3

Intersection of Multiple Arrays

- Given a 2D array `nums` that contains `n` arrays of distinct integers, return a sorted array containing all the numbers that appear in all `n` arrays.

Example

- For example, given `nums = [[3,1,2,4,5],[1,2,3,4],[3,4,5,6]]`, return `[3, 4]`. 3 and 4 are the only numbers that are in all arrays.

Check if All Characters Have Equal Number of Occurrences

- Given a string s , determine if all characters have the same frequency.

Example

- For example, given `s = "abacbc"`, return true. All characters appear twice. Given `s = "aaabb"`, return false. "a" appears 3 times, "b" appears 2 times. $3 \neq 2$.

Queries?

Thank You...!