Two Sum - Notes

Problem Statement:

Given an array of integers nums and an integer target, return indices of the two numbers such that they ad

You may assume that each input would have exactly one solution, and you may not use the same element

Approach 1: Brute Force

- Explanation:

Iterate through each pair of elements in the array and check if their sum equals the target.

- Time Complexity: O(n^2)

- Space Complexity: O(1)

Approach 2: Hash Map

- Explanation:

Iterate through the array while storing the complement (target - nums[i]) in a hash map.

If the current element exists in the map, a solution is found.

- Time Complexity: O(n)

- Space Complexity: O(n)

Approach 3: Two Pointers (Applicable if the array is sorted)

- Explanation:

Sort the array and use two pointers, one at the beginning and one at the end.

Move the pointers towards each other until the sum of the elements at the pointers equals the target.

- Time Complexity: O(n log n) (due to sorting)

- Space Complexity: O(1)

Corner / Edge Cases Handled:

- Duplicate values (e.g., [3, 3] with target 6)

- Negative numbers

- Target is 0

- Array with minimum two elements

- No need to handle multiple answers, as only one valid answer is guaranteed.