

Concatenation of Array

Problem Link

LeetCode - Concatenation of Array

<https://leetcode.com/problems/concatenation-of-array/>

Problem Statement

Given an integer array `nums` of length `n`, return an array `ans` of length `2n` such that:

$ans[i] = nums[i]$ for $0 \leq i < n$

$ans[i] = nums[i - n]$ for $n \leq i < 2n$

In short, the new array is the concatenation of `nums` with itself.

Example

Input: `nums = [1, 2, 1]`

Output: `[1, 2, 1, 1, 2, 1]`

Approach

- **1. Brute Force (not recommended for large input):**

Create a new array and append all elements of `nums` twice.

- Time Complexity: $O(n)$

- Space Complexity: $O(n)$

- **2. Preallocate + Fill (used in the solution):**

Preallocate an array of size `2n` and fill it using a single loop.

- Time Complexity: $O(n)$

- Space Complexity: $O(n)$

Time & Space Complexity

- Time: $O(n)$

- Space: $O(n)$