
ARRAY : Video - 87

Leetcode
- 442
~~Medium~~

EASY



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442. Find All Duplicates in an Array

Medium

Topics

Companies

Given an integer array `nums` of length `n` where all the integers of `nums` are in the range `[1, n]` and each integer appears once or twice, return an array of all the integers that appear twice.

You must write an algorithm that runs in $O(n)$ time and uses only constant extra space. ←

Example:-

nums =

0	1	2	3	4	5	6	7
4	<u>3</u>	<u>2</u>	7	8	<u>2</u>	<u>3</u>	1

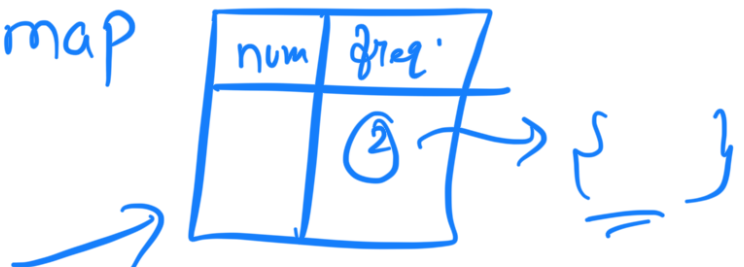
Output = {2, 3}

Brute Force - 1

0	1	2	3	4	5	6	7
4	3	2	7	8	2	3	1

T.C = $O(n)$
S.C = $O(n)$

map



Brute Force - 2

0	1	2	3	4	5	6	7
4	3	2	7	8	2	3	1

1, 2, 2, 3, 3, 4, 7, 8

{2, 3}

Sort.

$$T.C = O(n \log n)$$

$$S.C = O(1)$$

Optimal

$[1, n]$

(Already taught Pattern)

$$\Rightarrow 1 \leq \text{nums}[i] \leq n$$

“Use the numbers as index”

0	1	2	3	4	5	6	7
-4	-3	-2	-7	8	2	-3	-1

i

$$n = 8$$

$[1, n]$

$$(-3) < 0$$

$$\Rightarrow \text{num} = \text{abs}(\text{nums}[i]); \quad // 1$$

$$\text{idx} = \text{num} - 1; \quad // 0$$

$\{2, 3\} \leftarrow$

$$T.C = O(n)$$

$$S.C = O(1)$$

