

268. Missing Number

- Given an array `nums` containing n distinct numbers in the range $[0, n]$, return the only number in the range that is missing from the array.

Example 1:

- **Input:** `nums = [3,0,1]`
- **Output:** 2
- **Explanation:** $n = 3$ since there are 3 numbers, so all numbers are in the range $[0,3]$. 2 is the missing number in the range since it does not appear in `nums`.

Example 2:

- **Input:** `nums = [0,1]`
- **Output:** 2
- **Explanation:** $n = 2$ since there are 2 numbers, so all numbers are in the range $[0,2]$. 2 is the missing number in the range since it does not appear in `nums`.

Example 3:

- **Input:** nums = [9,6,4,2,3,5,7,0,1]
- **Output:** 8
- **Explanation:** n = 9 since there are 9 numbers, so all numbers are in the range [0,9]. 8 is the missing number in the range since it does not appear in nums.

Constraints:

- $n == \text{nums.length}$
- $1 \leq n \leq 10^4$
- $0 \leq \text{nums}[i] \leq n$
- All the numbers of nums are unique.

Follow up: Could you implement a solution using only $O(1)$ extra space complexity and $O(n)$ runtime complexity?