**First Missing Positive**

**Instruction:**

Given an unsorted integer array **nums**, return the smallest missing positive integer.

**You must implement an algorithm that runs in O(n) time and uses O(1) auxiliary space.**

**Example 1:**

Input: nums = [1,2,0]

Output: 3

Explanation: The numbers in the range [1,2] are all in the array.

**Example 2:**

Input: nums = [3,4,-1,1]

Output: 2

Explanation: 1 is in the array but 2 is missing.

**Constraints:**

* **1 <= nums.length <= 105**
* **-231 <= nums[i] <= 231 - 1**

**CASES TO TEST:**

**CASE 1:**

Input: **nums** = [1, 2, 0]

Expected Output = 3

**CASE 2:**

Input: **nums** = [3,4,-1,1]

Expected Output = 2

**CASE 3:**

Input: **nums** = [7,8,9,11,12]

Expected Output = 1