

```

class Solution {
    public int findDuplicate(int[] nums) {
        if (nums.length > 1) {
            int slow = nums[0];
            int fast = nums[nums[0]];
            while (slow != fast) {
                slow = nums[slow];
                fast = nums[nums[fast]];
            }

            fast = 0;
            while (fast != slow) {
                fast = nums[fast];
                slow = nums[slow];
            }
            return slow;
        }
        return -1;
    }
}

```

Given an array *nums* containing  $n + 1$  integers where each integer is between 1 and  $n$  (inclusive), prove that at least one duplicate number must exist. Assume that there is only one duplicate number, find the duplicate one.

### Example 1:

**Input:** [1,3,4,2,2]

**Output:** 2

### Example 2:

**Input:** [3,1,3,4,2]

**Output:** 3