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1966. Binary Searchable Numbers in an Unsorted Array

```java
class Solution {
    public int binarySearchableNumbers(int[] nums) {

    }
}
```

Consider a function that implements an algorithm **similar** to Binary Search. The function has two input parameters: `sequence` is a sequence of integers, and `target` is an integer value. The purpose of the function is to find if the `target` exists in the `sequence`.

The pseudocode of the function is as follows:

```
func(sequence, target)
  while sequence is not empty
    randomly choose an element from sequence as the pivot
    if pivot = target, return true
    else if pivot < target, remove pivot and all elements to its left from the sequence
    else, remove pivot and all elements to its right from the sequence
  end while
  return false
```

When the `sequence` is sorted, the function works correctly for **all** values. When the `sequence` is not sorted, the function does not work for all values, but may still work for **some** values.

Given an integer array `nums`, representing the `sequence`, that contains **unique** numbers and **may or may not be sorted**, return *the number of values that are* ***guaranteed*** *to be found using the function, for* ***every possible*** *pivot selection*.

Example 1:

```
Input: nums = [7]
Output: 1
Explanation:
Searching for value 7 is guaranteed to be found.
Since the sequence has only one element, 7 will be chosen as the pivot. Because the pivot equals
the target, the function will return true.
```

Example 2:

```
Input: nums = [-1,5,2]
Output: 1
Explanation:
Searching for value -1 is guaranteed to be found.
If -1 was chosen as the pivot, the function would return true.
If 5 was chosen as the pivot, 5 and 2 would be removed. In the next loop, the sequence would
have only -1 and the function would return true.
If 2 was chosen as the pivot, 2 would be removed. In the next loop, the sequence would have -1
and 5. No matter which number was chosen as the next pivot, the function would find -1 and
return true.

Searching for value 5 is NOT guaranteed to be found.
If 2 was chosen as the pivot, -1, 5 and 2 would be removed. The sequence would be empty and the
function would return false.

Searching for value 2 is NOT guaranteed to be found.
If 5 was chosen as the pivot, 5 and 2 would be removed. In the next loop, the sequence would
have only -1 and the function would return false.

Because only -1 is guaranteed to be found, you should return 1.
```

Constraints:

- `1 <= nums.length <=` 10^5
- -10^5 `<= nums[i] <=` 10^5
- All the values of `nums` are **unique**.

Follow-up: If `nums` has **duplicates**, would you modify your algorithm? If so, how?

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Hide Hint 1

The target will not be found if it is removed from the sequence. When does this occur?

Hide Hint 2

If a pivot is to the left of and is greater than the target, then the target will be removed. The same occurs when the pivot is to the right of and is less than the target.

Hide Hint 3

Since any element can be chosen as the pivot, for any target NOT to be removed, the condition described in the previous hint must never occur.