1692. Number of Ways to Reorder Array to Get Same BST

Difficulty : Hard

https://leetcode.com/problems/number-of-ways-to-reorder-array-to-get-same-bst

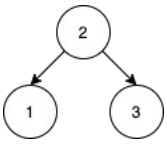
Given an array `nums` that represents a permutation of integers from `1` to `n`. We are going to construct a binary search tree (BST) by inserting the elements of `nums` in order into an initially empty BST. Find the number of different ways to reorder `nums` so that the constructed BST is identical to that formed from the original array `nums`.

- For example, given `nums = [2,1,3]`, we will have 2 as the root, 1 as a left child, and 3 as a right child. The array `[2,3,1]` also yields the same BST but `[3,2,1]` yields a different BST.

Return *the number of ways to reorder* `nums` *such that the BST formed is identical to the original BST formed from* `nums`.

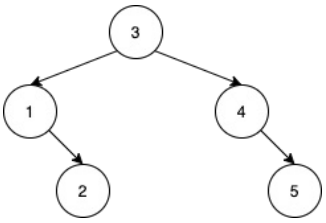
Since the answer may be very large, **return it modulo** $10^9 + 7$.

Example 1:



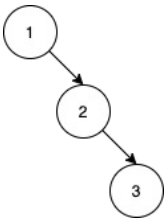

```
Input: nums = [2,1,3]
Output: 1
Explanation: We can reorder nums to be [2,3,1] which will yield the same BST. There are no other ways to reorder nums which will yield the same BST.
```

Example 2:




```
Input: nums = [3,4,5,1,2]
Output: 5
Explanation: The following 5 arrays will yield the same BST:
[3,1,2,4,5]
[3,1,4,2,5]
[3,1,4,5,2]
[3,4,1,2,5]
[3,4,1,5,2]
```

Example 3:




```
Input: nums = [1,2,3]
Output: 0
Explanation: There are no other orderings of nums that will yield the same BST.
```

Constraints:

- `1 <= nums.length <= 1000`
- `1 <= nums[i] <= nums.length`
- All integers in `nums` are **distinct**.