Problem 2948: Make Lexicographically Smallest Array by Swapping Elements

Problem Information

Difficulty: Medium
Acceptance Rate: 60.22%
Paid Only: No
Tags: Array, Union Find, Sorting

Problem Description

You are given a **0-indexed** array of **positive** integers `nums` and a **positive** integer `limit`.

In one operation, you can choose any two indices `i` and `j` and swap `nums[i]` and `nums[j]` **if** `|nums[i] - nums[j]| <= limit`.

Return _the**lexicographically smallest array** that can be obtained by performing the operation any number of times_.

An array `a` is lexicographically smaller than an array `b` if in the first position where `a` and `b` differ, array `a` has an element that is less than the corresponding element in `b`. For example, the array `[2,10,3]` is lexicographically smaller than the array `[10,2,3]` because they differ at index `0` and `2 < 10`.

Example 1:

Input: nums = [1,5,3,9,8], limit = 2 **Output:** [1,3,5,8,9] **Explanation:** Apply the operation 2 times: - Swap nums[1] with nums[2]. The array becomes [1,3,5,9,8] - Swap nums[3] with nums[4]. The array becomes [1,3,5,8,9] We cannot obtain a lexicographically smaller array by applying any more operations. Note that it may be possible to get the same result by doing different operations.

Example 2:

Input: nums = [1,7,6,18,2,1], limit = 3 **Output:** [1,6,7,18,1,2] **Explanation:** Apply the operation 3 times: - Swap nums[1] with nums[2]. The array becomes [1,6,7,18,2,1] - Swap nums[0] with nums[4]. The array becomes [2,6,7,18,1,1] - Swap nums[0] with nums[5]. The array becomes [1,6,7,18,1,2] We cannot obtain a lexicographically smaller array by applying any more operations.

Example 3:

Input: nums = [1,7,28,19,10], limit = 3 **Output:** [1,7,28,19,10] **Explanation:** [1,7,28,19,10] is the lexicographically smallest array we can obtain because we cannot apply the operation on any two indices.

Constraints:

* `1 <= nums.length <= 105` * `1 <= nums[i] <= 109` * `1 <= limit <= 109`

Code Snippets

C++:

```
class Solution {
public:
vector<int> lexicographicallySmallestArray(vector<int>& nums, int limit) {

}
};
```

Java:

```
class Solution {
public int[] lexicographicallySmallestArray(int[] nums, int limit) {

}
}
```

Python3:

```
class Solution:
def lexicographicallySmallestArray(self, nums: List[int], limit: int) ->
List[int]:
```