

Next Permutation

Example:

arr = 0 1 2 5 3 3 0

Consider this number 0125330

The next permutation for this is

=> 0130235

Pre [0 1 2 5 3 3 0]

Post [0 1 3 0 2 3 5]

When you compare these numbers the first change from the left would be at index=2, and how do we find that is by finding the longest non increasing suffix, what it means is find a sub part of array where numbers are decreasing from the left to right, we need to find the longest one from the last

Step 1: Find longest non increasing suffix

0 1 2 [5 3 3 0] =>

```
for i in range(n-1, 0, -1):
    if (nums[i] > nums[i-1]):
        index = i
        break
```

Step 2: Identify pivot

0 1 [2] 5 3 3 0

Step 3: Find the right most successor to pivot in the suffix

While we are finding longest non increasing suffix we are ensuring that the number which is starting by the pivot is this, and it is the last one in that series with that number. Now as this is the last number in the series starting with pivot, we need to find rightmost successor to pivot in the suffix

0 1 2 5 3 3 0

↑ ↑
index-1 index

```
for i in range(index+1, n):
    if nums[i] > nums[index-1] and
        nums[i] <= nums[prev]:
        prev = i
```

Now, as we got pivot that is index-1 => 2, we need to replace it with just greater element to pivot and smaller than index. Then swap array values from index to the end of the array

Step 4: swap with pivot => 0135320 Step 5: Rev suffix => 0130235