

Permutations II

This problem is similar to the basic permutations problem but requires handling duplicates to return unique permutation.

[Key Idea:]

- Sort the array first so duplicates are adjacent.
- During backtracking, skip duplicates by checking:
 - If $\text{nums}[i] == \text{nums}[i-1]$ and $\text{nums}[i-1]$ is not used in current recursion level, skip.

[Algorithm:]

1. Sort nums .
2. Use a $\text{used}[]$ boolean array to track elements in current permutation.
3. For each index i :
 - Skip if $\text{used}[i] == \text{true}$.
 - Skip if $i > 0 \ \&\& \ \text{nums}[i] == \text{nums}[i-1] \ \&\& \ !\text{used}[i-1]$ (avoid duplicates)
4. Build permutations recursively.

[Complexity:]

- Time: $O(n \times n!)$ worst case ($n!$ permutations, each of length n)
- Space: $O(n)$ recursion + $O(n)$ used array