

That's a great question — learning how to *think* in backtracking is the real superpower. Let's break it down into a **practical strategy** you can use to approach **any backtracking problem**, like a mental checklist.

Backtracking Template (Mental Checklist)

Most backtracking problems follow this skeleton:

```
void backtrack(choices_so_far) {
    if (base_case_condition) {
        store_solution(choices_so_far);
        return;
    }

    for (all available choices at this point) {
        if (this choice is invalid) continue;

        make this choice;
        backtrack(updated_choices);
        undo the choice; // backtrack
    }
}
```



How to Build This Template for Any Problem:

Let's apply this systematically:



Step 1: Understand What You're Trying to Build

Ask: What does one *complete solution* look like?

- Is it a permutation? (→ Order matters, all elements used once)
- Is it a combination? (→ Order doesn't matter)
- Is it a subset? (→ Include or not include each element)
- Is it a path? (→ From a starting point to a goal?)

For `permuteUnique`, the answer is:

A complete permutation of the array where each element is used **once**, and **duplicates are skipped**.

✓ Step 2: What is the Recursion Decision at Each Step?

Ask: What am I choosing at each step?

- For permutations: Which unused element to place at the current position.
- For combinations: Which elements to pick without reusing previous ones.
- For subsets: Whether to include each element or not.

So for permutations:

At each level, choose an unused element from the array and mark it as used.

✓ Step 3: Prevent Repetition and Prune Tree

This is where things like sorting, `used[]`, and `i > 0 && nums[i] == nums[i-1] && !used[i-1]` come in.

Why this check?

```
if (i > 0 && nums[i] == nums[i-1] && !used[i-1]) continue;
```

This skips **duplicates at the same recursion level**.

✓ Step 4: Undo Your Choice (Backtrack)

Every time you make a choice (push into temp + mark used), you must undo it later (pop + unmark used). That's the "**backtrack**" part of the technique.

Pro Tip: Template Practice

Try solving each of these with backtracking:

1. **Permutations** (basic)
2. **Permutations with Duplicates**
3. **Subsets**
4. **Subsets with Duplicates**
5. **Combination Sum** (repeated numbers allowed)
6. **Combination Sum II** (unique numbers)
7. **Palindrome Partitioning**
8. **N-Queens**

You'll notice that **all of them follow the same recursive skeleton** with slight adjustments.