129. Sum Root to Leaf Numbers

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- **Depth-first Search** + Tree

Description

Given a binary tree containing digits from `0-9` only, each root-to-leaf path could represent a number.

An example is the root-to-leaf path `1->2->3` which represents the number `123`.

Find the total sum of all root-to-leaf numbers.

For example,

```
    1
   / \
  2   3
```

The root-to-leaf path `1->2` represents the number `12`.
The root-to-leaf path `1->3` represents the number `13`.

Return the sum = 12 + 13 = `25`.

1. Thought line

2. Depth-first Search + Tree

```
/**
 * Definition for a binary tree node.
 * struct TreeNode {
 *     int val;
 *     TreeNode *left;
 *     TreeNode *right;
 *     TreeNode(int x) : val(x), left(NULL), right(NULL) {}
 * };
 */
class Solution {
private:
    void sumNumbersDSP(TreeNode* node, int preSum, int& result){
        if (node==nullptr) return ;
        if (node->left==nullptr && node->right==nullptr) {
            result += preSum*10 + node->val;
            return;
        }
        sumNumbersDSP(node->left, preSum*10 + node->val, result);
        sumNumbersDSP(node->right, preSum*10 + node->val, result);
    }
public:
    int sumNumbers(TreeNode* root) {
        int result = 0;
        sumNumbersDSP(root, 0, result);
        return result;
```

```
    }
};
```