017. Letter Combinations of a Phone Number

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- **BackTracking**

Description

Given a digit string, return all possible letter combinations that the number could represent.

A mapping of digit to letters (just like on the telephone buttons) is given below.


```
Input:Digit string "23"
Output: ["ad", "ae", "af", "bd", "be", "bf", "cd", "ce", "cf"].
```

Note:

Although the above answer is in lexicographical order, your answer could be in any order you want.

BackTracking

```cpp
class Solution {
public:
    vector<string> letterCombinations(string digits) {
        vector<string> result;
        if(digits.empty()) return vector<string>();
        static const vector<string> v = {"", "", "abc", "def", "ghi", "jkl", "mno",
                                         "pqrs", "tuv", "wxyz"};

        result.push_back("");   // add a seed for the initial case
        for(int i = 0 ; i < digits.size(); ++i) {
            int num = digits[i]-'0';
            if(num < 0 || num > 9) break;

            const string& candidate = v[num];
            if(candidate.empty()) continue;

            vector<string> tmp;
            for(int j = 0 ; j < candidate.size() ; ++j) {
                for(int k = 0 ; k < result.size() ; ++k) {
                    tmp.push_back(result[k] + candidate[j]);
                }
            }
            result.swap(tmp);
        }
        return result;
    }
};
```