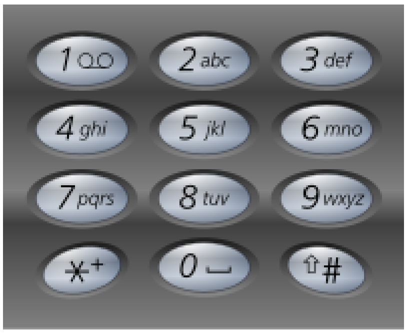
一、题目说明

题目17. Letter Combinations of a Phone Number，题目给了下面一个图，输入一个字符串包括2-9，输出所有可能的字符组合。



如输入23所有可能的输出：

```
"ad", "ae", "af", "bd", "be", "bf", "cd", "ce", "cf"
```

二、我的做法

这个题目，我思考了4个小时（惭愧严重超时了），做法如下：

```
#include<iostream>
#include<vector>
#include<unordered_map>
using namespace std;
class Solution{
    public:
        vector<string> letterCombinations(string s){
            vector<string> res;

            if(s.size()<1) return res;
            int num = 1;
            unordered_map<char,string> ump;

            ump['2'] = "abc";
            ump['3'] = "def";
            ump['4'] = "ghi";
            ump['5'] = "jkl";
            ump['6'] = "mno";
            ump['7'] = "pqrs";
            ump['8'] = "tuv";
            ump['9'] = "wxyz";

            for(int i=0;i<s.size();i++){
                switch(s[i]){
                    case '2':
                    case '3':
                    case '4':
                    case '5':
                    case '6':
                    case '8':
                        num *= 3;
                        break;
                    case '7':
                    case '9':
                        num *=4;
                        break;
                }
            }
            for(int i=0;i<num;i++){
                res.push_back("");
            }

            int curNum = num;
            for(int j=0;j<s.size();++j){
                char curr = s[j];
                string curStr = ump[curr];
                curNum /= curStr.size();
                for(int i=0;i<num;i++){
                    res[i].push_back(curStr[i / curNum % curStr.size()]);
                }
            }

            return res;
        }
};
int main(){
    Solution s;
//    vector<string> r = s.letterCombinations("234");
//    for(vector<string>::iterator it=r.begin();it!=r.end();++it){
//      cout<<*it<<" ";
//  }
//  cout<<endl;
    vector<string> r = s.letterCombinations("8");
    for(vector<string>::iterator it=r.begin();it!=r.end();++it){
        cout<<*it<<" ";
    }
    return 0;
}
```

这个是我第一次，做“完美”的代码。臭美一下！

```
Runtime: 0 ms, faster than 100.00% of C++ online submissions for Letter
Combinations of a Phone Number.
Memory Usage: 8.4 MB, less than 100.00% of C++ online submissions for Letter
Combinations of a Phone Number.
```

三、更优化的做法

第一次可以自豪的说一句，这个就是最优化的代码了。哈哈！