89. Gray Code

Total Accepted: **60176** Total Submissions: **165035** Difficulty: **Medium**

The gray code is a binary numeral system where two successive values differ in only one bit.

Given a non-negative integer *n* representing the total number of bits in the code, print the sequence of gray code. A gray code sequence must begin with 0.

For example, given *n* = 2, return [0,1,3,2]. Its gray code sequence is:

00 - 0

01 - 1

11 - 3

10 - 2

Note:

For a given *n*, a gray code sequence is not uniquely defined.

For example, [0,2,3,1] is also a valid gray code sequence according to the above definition.

For now, the judge is able to judge based on one instance of gray code sequence. Sorry about that.

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```
//C++
//Author:zzw
class Solution {
public:
    vector<int> grayCode(int n) {
        vector<int> res;
        if(n==0)
        {
            res.push_back(0);
            return res;
        }
        res = grayCode(n-1);
        int size = res.size();
        for(int i=size-1;i>=0;i--)
        {
            res.push_back(res[i]+(1<<(n-1)));
        }
        return res;
    }
};
```