Construct list using given q XOR queries

Given a list s that initially contains only a single value 0. There will be q queries of the following types:

0 x: Insert x in the list

1 x: For every element a in s, replace it with a ^ x. ('^' denotes the bitwise XOR operator)

Return the sorted list after performing the given q queries.

Example 1:

Input:

q = 5

queries[] = {{0, 6}, {0, 3}, {0, 2}, {1, 4}, {1, 5}}

Output:

1 2 3 7

Explanation:

[0] (initial value)

[0 6] (add 6 to list)

[0 6 3] (add 3 to list)

[0 6 3 2] (add 2 to list)

[4 2 7 6] (XOR each element by 4)

[1 7 2 3] (XOR each element by 5)

The sorted list after performing all the queries is [1 2 3 7].

Example 2:

Input:

q = 3

queries[] = {{0, 2}, {1, 3}, {0, 5}}

Output :

1 3 5

Explanation:

[0] (initial value)

[0 2] (add 2 to list)

[3 1] (XOR each element by 3)

[3 1 5] (add 5 to list)

The sorted list after performing all the queries is [1 3 5].

Your Task:

You don't need to read input or print anything. Your task is to complete the function constructList() which takes an integer q the number of queries and queries[] a list of lists of length 2 denoting the queries as input parameters and returns the final constructed list.

Expected Time Complexity: O(q\*log(q))

Expected Auxiliary Space: O(l), where l is only used for output-specific requirements.

Constraints:

1 ≤ q ≤ 105

class Solution {

public:

vector<int> constructList(int q, vector<vector<int>> &queries) {

vector<int> res;

int xorVal = 0;

for(int i = q-1; i >= 0; i--) {

int type = queries[i][0], val = queries[i][1];

if(type == 0) res.push\_back(xorVal ^ val);

else xorVal ^= val;

}

res.push\_back(xorVal);

sort(res.begin(), res.end());

return res;

}

};

Link : <https://www.geeksforgeeks.org/problems/construct-list-using-given-q-xor-queries/1>