Problem Link:

<https://leetcode.com/problems/minimum-operations-to-make-array-elements-zero/?envType=daily-question&envId=2025-09-06>

Solution:

class Solution {

public:

using ll = long long;

long long minOperations(vector<vector<int>>& queries) {

vector<tuple<ll, ll, int>> intervals;

ll start = 1;

int s = 1;

while(start <= 1e9)

{

ll end = min(start \* 4 - 1, (ll)1e9);

intervals.emplace\_back(start, end, s);

start \*= 4;

s++;

}

ll o = 0;

for(const auto& q : queries)

{

int l = q[0], r = q[1];

ll t = 0;

for(const auto& [start, end, s] : intervals)

{

if(r < start)

break;

if(l > end)

continue;

ll left = max((ll)l, start);

ll right = min((ll)r, end);

ll c = right - left + 1;

t += c \* s;

}

o += (t + 1) / 2;

}

return o;

}

};