NAME : Manjot Singh UID : 23BCS 12549 SECTION : KRG-2A

Problem

We define $f(x, y)$ such that it returns number of different corresponding bits in the binary representation of x and y. We must print sum of all pair values formed over a vector.

Algorithm :

1) Run loop $b = 0 \rightarrow 31$ (to iterate over each bit)
2) Initialize count1 = 0
3) Run nested loop for $i = 0 \rightarrow n$
4) if (arr[i] & (1 << b) == 1)
5) Increment count1.
   End if . End inner loop.
6) count0 = n - count1
7) Ans = Ans + count0 * count1

   End for loop
   End for loop
8) Print ans.

Code

```
#include <bits/stdc++.h>
using namespace std;
int f(long long a, long long b){

int main(){
    int m;
    cin >> m;
    vector<int> arr(m);
    for(int i=0; i<m; i++){
        cin >> arr[i];
    }
    int ans=0;
    for(int b=0; b<=31; b++){
        int count1=0;
        for(int i=0; i<m; i++){
            if(arr[i] & (1<<b)){
                count1++;
            }
        }
        int count0 = m - count1;
        ans += count0 * count1;
    }
    cout << ans * 2 ;
```

Complexity

Time complexity : O(m)

Space complexity : O(1)