PROBLEM

Sum of Products

Medium Accuracy: 50.93% Submissions: 31K+ Points: 4

Given an array **arr**[] of size **n**. Calculate the **sum of Bitwise ANDs** ie: calculate sum of *arr[i] & arr[j]* for **all the pairs** in the given array **arr**[] where **i < j**.

Example 1:

Input:
n = 3
arr = {5, 10, 15}
Output:
15
Explanation:
The bitwise Ands of all pairs where i<j are (5&10) = 0, (5&15) = 5 and (10&15) = 10.
Therefore, the total sum = (0+5+10) = 15.

Example 2:

Input:
n = 4
arr = {10, 20, 30, 40}
Output:
46
Explanation:
The sum of bitwise Ands
of all pairs = (0+10+8+20+0+8) = 46.

Your Task:
You don't need to read input or print anything.Your Task is to complete the function **pairAndSum()** which takes an Integer **n** and an array **arr**[] of size **n** as input parameters and **returns** the **sum** of **bitwise Ands** of **all pairs**.

Expected Time Complexity:O(n)
Expected Auxillary Space:O(1)

Constraints:
$1 <= n <= 10^5$
$1 <= arr[i] <= 10^8$

CODE

```
#User function Template for python3


class Solution:

   def pairAndSum(self, n, arr):

      ans = 0

      for i in range(32):

         c = 0

         for j in arr:

            if (j>>i)&1:

               c += 1


         if c > 1:

            ans += (2**i)*((c-1) * c)//2


      return ans

      #code here
```