Q. Given an *array* of *N* positive integers. You can perform this operation any number of times, choose two indices x and y. If array[x] = a and array[y] = b, then after the operation.

1. array[x] = a OR b, array[y] = a AND b.

Perform the operations optimally such that ∑array[i]*array[i] for all 1<=i<=n is maximum. Print the largest sum of squares you can get after performing the operations greater than equal to zero times

---

SOLUTION -

A+b = a|b + a&b

A+b = a^b + 2(a&b)

A1+a2+a3+a4….an = Const

max($a1^2 + a2^2$) = **make a1 as big as possible**

A1 + a2 = 5, $a1^2 + a2^2$ = max -> a1 = 5, a2 = 0

Arr = 1 5 6

2 1 0

1 - **0 0 1** -> **1 1 1 - 7**

5 - **1 0 1** **1 1 1 - 7**

6 - **1 1 0** **0 0 0 - 0** -> **$7^2 + 7^2 = 98$**

A b	x = a|b	y = a&b
5 1		
2- 1 0	1	0
1- 1 0	1	0
0- 0 1	1	0

Consider Array - 1, 3, 5, 6

Real Matrix -

2	**0**	**0**	**1**	**1**	**#1 -2-> 0**
1	**0**	**1**	**0**	**1**	**#1 - 2->0**
0	**1**	**1**	**1**	**0**	**#1 - 3->0**
	1	**3**	**5**	**6**	

Transformation

2	**1**	**1**	**0**	**0**	**#1 - 2**
1	**1**	**1**	**0**	**0**	**#1 - 2**
0	**1**	**1**	**1**	**0**	**#1 - 3**
	1 - 7	**3 - 7**	**5 - 1**	**6 - 0**	

1	**1**	**0**	**0**
1	**1**	**0**	**0**
1	**1**	**1**	**0**