Divide Integers

Problem Description

Divide two integers without using multiplication, division and mod operator. Return the floor of the result of the division. Also, consider if there can be overflow cases i.e output is greater than INT\_MAX, return INT\_MAX. NOTE: INT\_MAX = 2^31 - 1

Problem Constraints

-231 <= A, B <= 231-1

B!= 0

Input Format

First argument is an integer A denoting the dividend. Second argument is an integer B denoting the divisor. Output Format

Return an integer denoting the floor value of the division. Example Input

Input 1:

A = 5

B = 2

Input 2:

A = 7

B = 1

Example Output

Output 1:

2

Output 2:

7

Example Explanation

Explanation 1:

floor(5/2) = 2

Different Bits Sum Pairwise

Problem Description

We define f(X, Y) as number of different corresponding bits in binary

representation of X and Y. For example, f(2, 7) = 2, since binary representation of 2 and 7 are 010 and 111, respectively. The first and the third bit differ, so f(2, 7) = 2. You are given an array of N positive integers, A1, A2 ,..., AN. Find sum of f(Ai,

Aj) for all pairs (i, j) such that 1 ≤ i, j ≤ N. Return the answer modulo 109+7.

Problem Constraints

1 <= N <= 105

1 <= A[i] <= 231 - 1

Input Format

First and only argument of input contains a single integer array A. Output Format

Return a single integer denoting the sum. Example Input

Input 1:

A = [1, 3, 5]

Input 2:

A = [2, 3]

Example Output

Ouptut 1:

8

Output 2:

2

Example Explanation

Explanation 1:

f(1, 1) + f(1, 3) + f(1, 5) + f(3, 1) + f(3, 3) + f(3, 5) +

f(5, 1) + f(5, 3) + f(5, 5)

= 0 + 1 + 1 + 1 + 0 + 2 + 1 + 2 + 0 = 8

Explanation 2:

f(2, 2) + f(2, 3) + f(3, 2) + f(3, 3) = 0 + 1 + 1 + 0 = 2