2354. Number of Excellent Pairs

Description

You are given a **0-indexed** positive integer array `nums` and a positive integer `k`.

A pair of numbers `(num1, num2)` is called **excellent** if the following conditions are satisfied:

- **Both** the numbers `num1` and `num2` exist in the array `nums`.
- The sum of the number of set bits in `num1 OR num2` and `num1 AND num2` is greater than or equal to `k`, where `OR` is the bitwise **OR** operation and `AND` is the bitwise **AND** operation.

Return *the number of **distinct** excellent pairs*.

Two pairs `(a, b)` and `(c, d)` are considered distinct if either `a != c` or `b != d`. For example, `(1, 2)` and `(2, 1)` are distinct.

Note that a pair `(num1, num2)` such that `num1 == num2` can also be excellent if you have at least **one** occurrence of `num1` in the array.

Example 1:

```
Input: nums = [1,2,3,1], k = 3
Output: 5
Explanation: The excellent pairs are the following:
- (3, 3). (3 AND 3) and (3 OR 3) are both equal to (11) in binary. The total number of set bits is 2 + 2 = 4, which is greater than or equal to k = 3.
- (2, 3) and (3, 2). (2 AND 3) is equal to (10) in binary, and (2 OR 3) is equal to (11) in binary. The total number of set bits is 1 + 2 = 3.
- (1, 3) and (3, 1). (1 AND 3) is equal to (01) in binary, and (1 OR 3) is equal to (11) in binary. The total number of set bits is 1 + 2 = 3.
So the number of excellent pairs is 5.
```

Example 2:

```
Input: nums = [5,1,1], k = 10
Output: 0
Explanation: There are no excellent pairs for this array.
```

Constraints:

- `1 <= nums.length <= 10^5`
- `1 <= nums[i] <= 10^9`
- `1 <= k <= 60`