Given an integer array arr. You have to sort the integers in the array in ascending order by the number of **1's** in their binary representation and in case of two or more integers have the same number of **1's** you have to sort them in ascending order.

Return *the sorted array*.

**Example 1:**

**Input:** arr = [0,1,2,3,4,5,6,7,8]

**Output:** [0,1,2,4,8,3,5,6,7]

**Explantion:** [0] is the only integer with 0 bits.

[1,2,4,8] all have 1 bit.

[3,5,6] have 2 bits.

[7] has 3 bits.

The sorted array by bits is [0,1,2,4,8,3,5,6,7]

**Example 2:**

**Input:** arr = [1024,512,256,128,64,32,16,8,4,2,1]

**Output:** [1,2,4,8,16,32,64,128,256,512,1024]

**Explantion:** All integers have 1 bit in the binary representation, you should just sort them in ascending order.

**Example 3:**

**Input:** arr = [10000,10000]

**Output:** [10000,10000]

**Example 4:**

**Input:** arr = [2,3,5,7,11,13,17,19]

**Output:** [2,3,5,17,7,11,13,19]

**Example 5:**

**Input:** arr = [10,100,1000,10000]

**Output:** [10,100,10000,1000]

**Constraints:**

* 1 <= arr.length <= 500
* 0 <= arr[i] <= 10^4