Bit-Manipulation

video-4

Leetcode
-1356

Easy

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Sort Integers by The Number Of 1 bits

Company :- amazon

1356. Sort Integers by The Number of 1 Bits

Hint

Easy 1.9K 96

Companies

Sort C++/Java.

You are given an integer array `arr`. 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 array after sorting it*.

Example :- arr = {5, 2, 3, 8}

101 10 11 1000

(2) (1) (2) (1)

Output = {2, 8, 3, 5}

Before we start, we should know How to write comparator/lambda

for Sort

return type ↑ auto name ↑ lambda = [ ] (int&a, int&b) {

capture clause

Receive Parameters ↑

--bm.

```
int cA = --bmtfree(a);
int cB = --h(b);
if (cA == cB)
    return a<b ; //asc.

return cA < cB ; //asc. on basis of 1 bit count.
};
```

True.

$O(n\log(n) * \log_2(num))$

⇒ Sort(begin(arr), end(arr), lambda);

int find1bitsCount(int num) {

```
int count = 0;
while (num != 0) {
    count += (num & 1);
    num >= 1;
}
return count;
}
```

1001

num → $\log_2(num)$

$O(\log(num))$

1bits = 3

→ num = 1101
& 0001 ←
0001 ← one

1

num = 0110 ←
& 0001 ← one
0

num = 0011
& 0001

1

0 0 0 1 ← one

num = 0 0 0 1
& 0 0 0 1
0 0 0 1 ← one

num = 0 0 0 0

App: 2 O(n log n) overall.

C++ = __builtin_popcount(num); //O(1)

JAVA = Integer.bitCount(num); //O(1)