Hash Map/Set

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Leetcode
-823
Medium

Binary Tree with Factors.

Company :- Google

823. Binary Trees With Factors

Medium 2.6K 193

Companies

Given an array of unique integers, `arr`, where each integer `arr[i]` is strictly greater

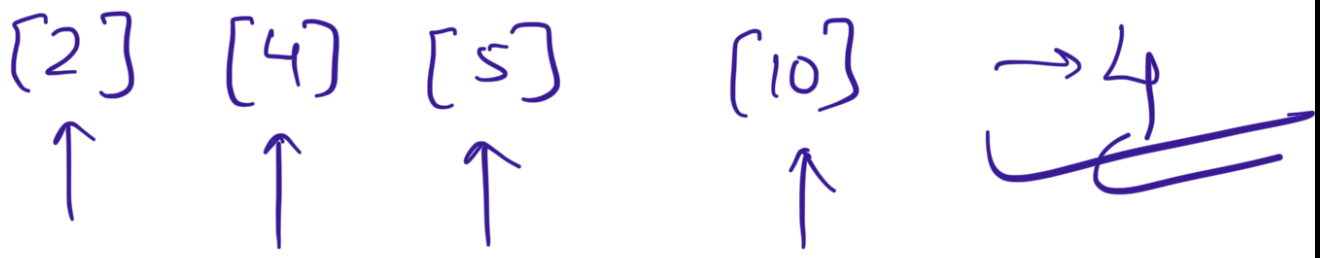
than `1`.

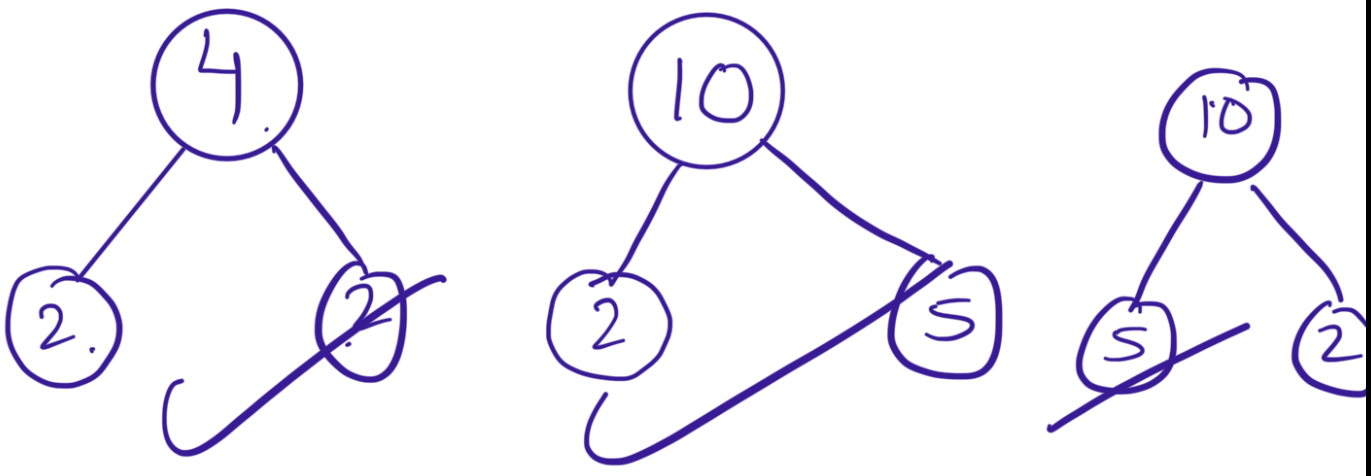
We make a binary tree using these integers, and each number may be used for any number of times. Each non-leaf node's value should be equal to the product of the values of its children.

Return *the number of binary trees we can make*. The answer may be too large so return the answer **modulo** `10^9 + 7`.

Example :- arr = {2, 4, 5, 10}

Output = 7





Intuition :-

map → 5, 2, 4, 10

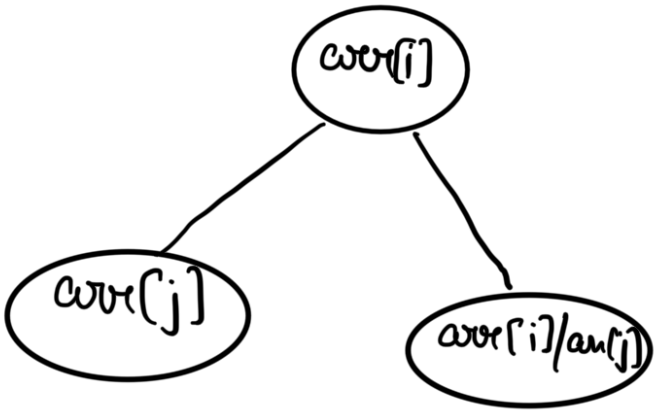
{4}, {4,2,2}, {2}, {5}, {10}, {10,2,5}, {10,5,2}

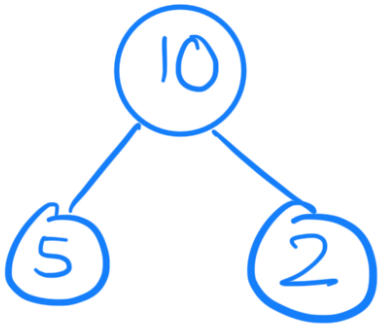
{ 4, 2, 5, 10 }

$4 = 2x$

$x = 4/2$

2
1
1
1
1
1





$5x = 10$

$x = 10/5 = 2$

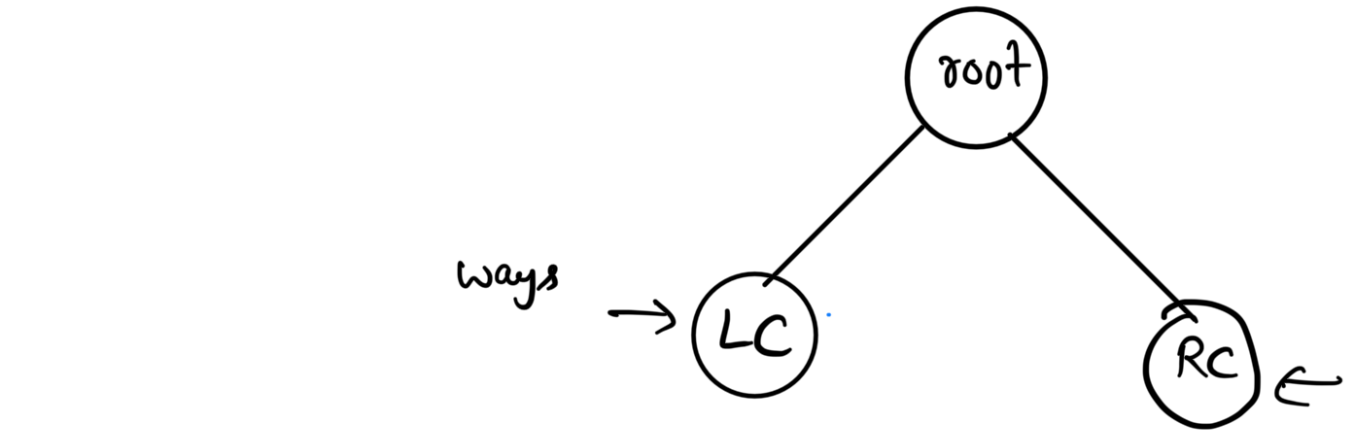
Sort:- { 2, 4, 5, 10 }

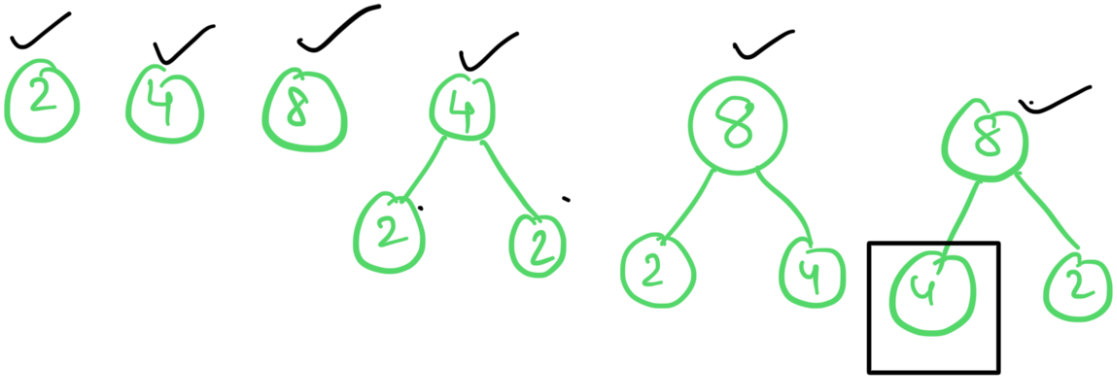
Sort:-

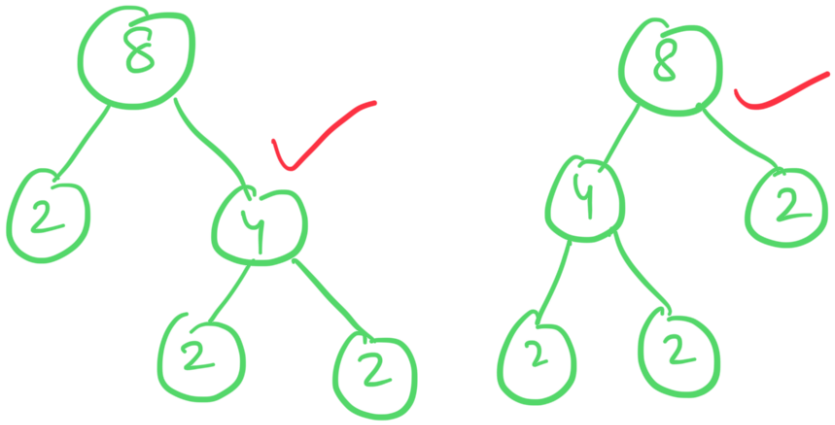
```
for (i=0; i<n; i++) {
    for(j=0; j<i; j++)
```

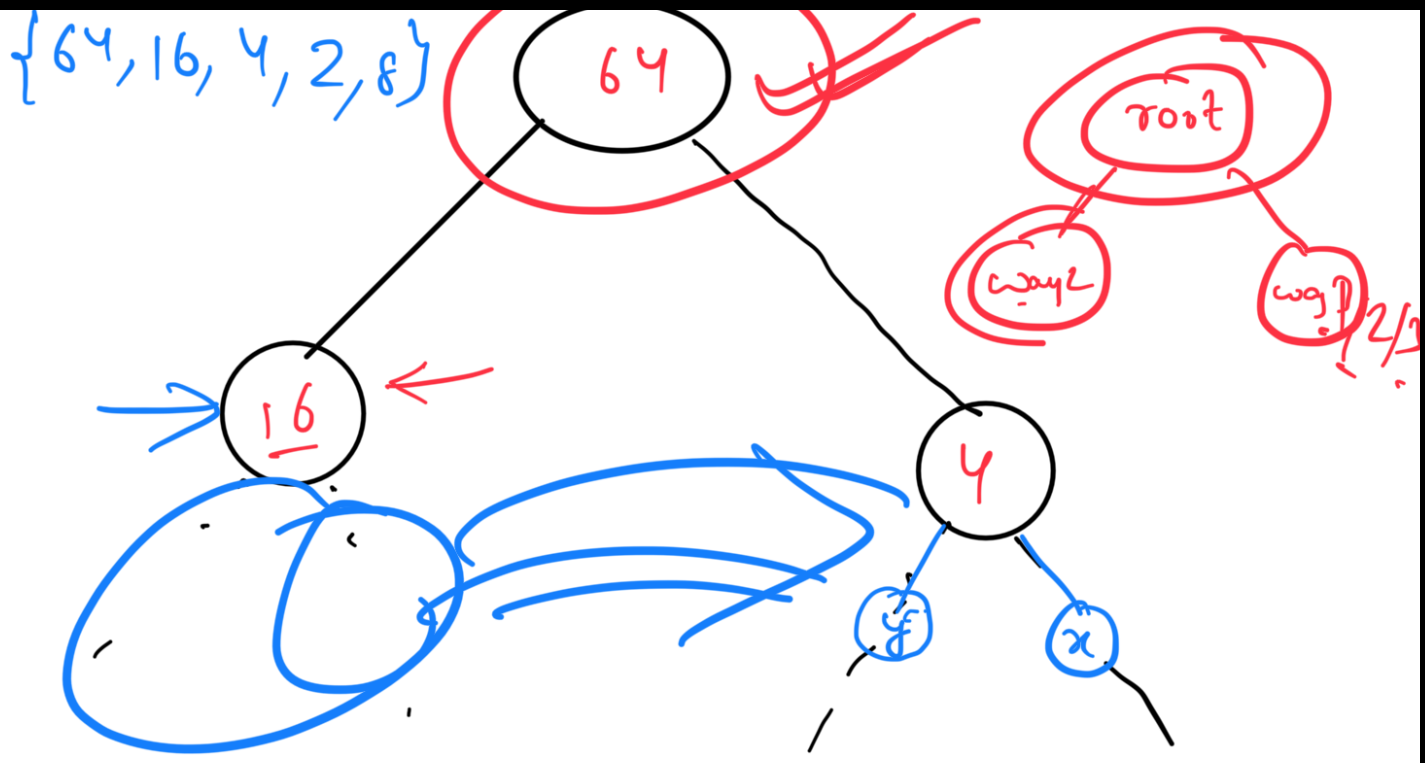
Map

Most important Part of the Qu









LC

Multiply

RC

way1
way2
way3
way4

4

way1
way2
way3

3

4 * 3

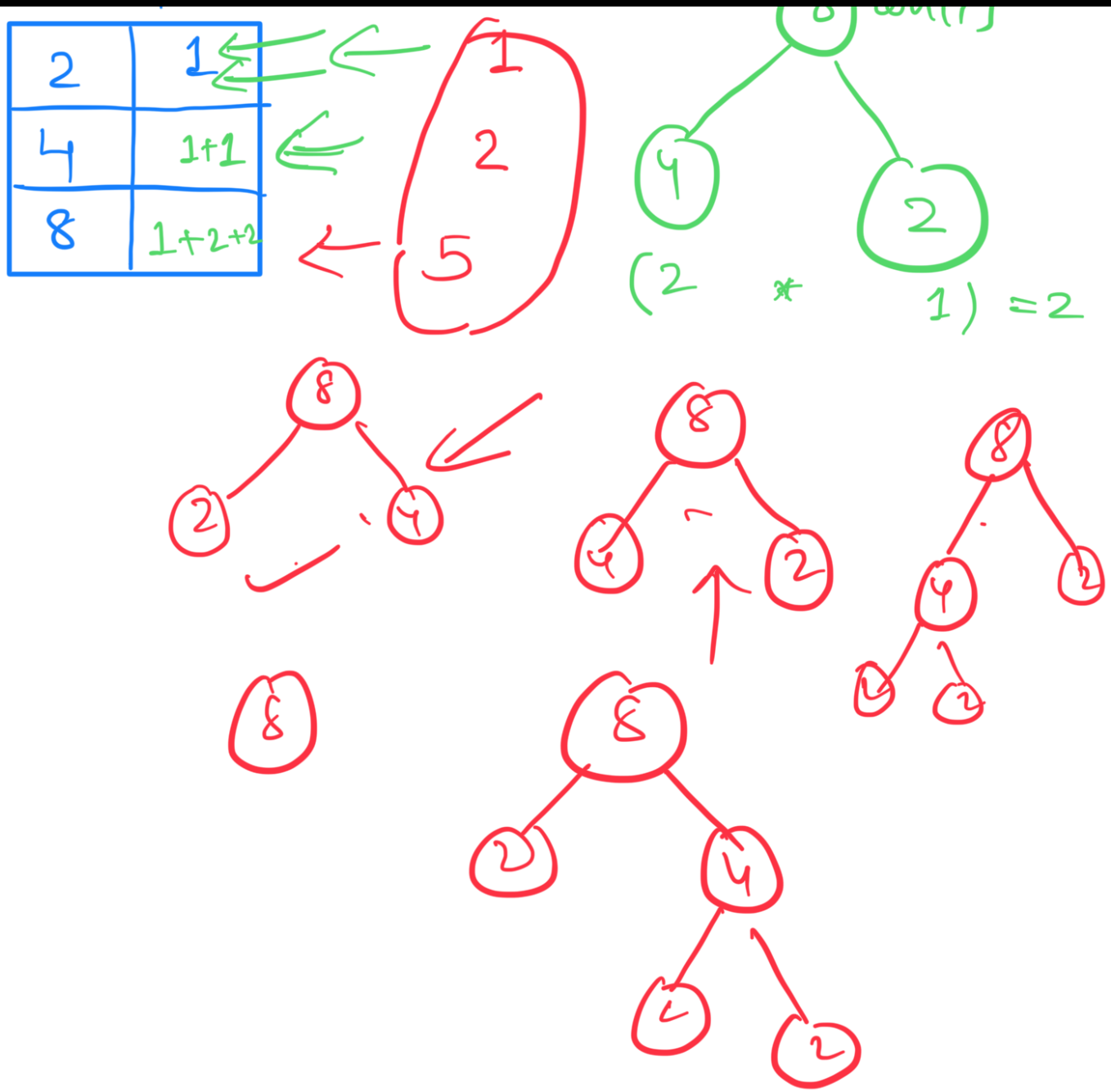
0 1 2

8 → {2, 4, 8}

{4}

4
2 2

map



① Sort → O(n log n)

② map O(n) space

③ i = 1; i<n

④ j = 0; j<i } T.C. O(n²)

root = arr[i]

⑤ Multiply. LC = arr[j]; root % LC == 0

RC = root / LC → map.

mp[root] += mp[LC] * mp[RC]