Play with binary trees

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1. Topic

Binary tree + DFS

2. Description

Professor P has planted some special binary trees. They are so friendly and want to play with DSA students.

The main goal is to calculate root and all the leaves vertically(which means caculate all the nodes and its left/right child respectively), and trying to find sets of leaves which sum up with the specific number. (by using depth first traversal)

3. Input and output format

All the trees are perfect binary trees (number of the external nodes is 2^(depth)).

Input:
N
A1
B1 B2
C1 C2 C3 C4
…
M
Output:
a1 a2 a3 a4 …
b1 b2 b3 b4 b5…
……

N: Number of the depth of the binary tree. (<= 20)
M: The specific number (int).
A, B, C…: Numbers of nodes (in level order). (int, 2^(depth))
(Warning: After the last number, do not add space. Just add \n directly instead.)
a, b, c…: Sets of vertical nodes.

"""Hint""": **The length of the answer sets are not always (depth+1)**.you have to search until reach the external nodes,but note that if you haven't reach the leaves but the current sum is equal to the M,than this set should also be one of the answer sets.

4. Sample input and output

Input:
5
1
2 3
10 67 33 25
57 11 100 25 20 33 12 11

52 1001 21 46 2135 21 4 48 13 3 256 80 12 565 700 32
12 23 34 45 56 25 67 78 89 90 100 120 140 160 180 200 1 2 3 4 5 6 7 8 17 27 37 47 57 67 77 87
70
Output:
1 2 10 57
1 2 10 11 21 25
1 2 10 11 46
1 2 67
1 3 33 20 13
1 3 33 33
1 3 25 12 12 17

Input2:
3
1
8 2
2 4 9 7
1 2 1 1 3 4 6 1
12

Output2:
1 8 2 1
1 2 9

5. Time and memory limit

Time: 5s.
Memory: 256 mb.(You don’t have to worry about this.)

6. Slides

https://drive.google.com/open?id=0Bwb0IZQKBTW-MjlYXzlGUzJ2VDQ