655. Print Binary Tree

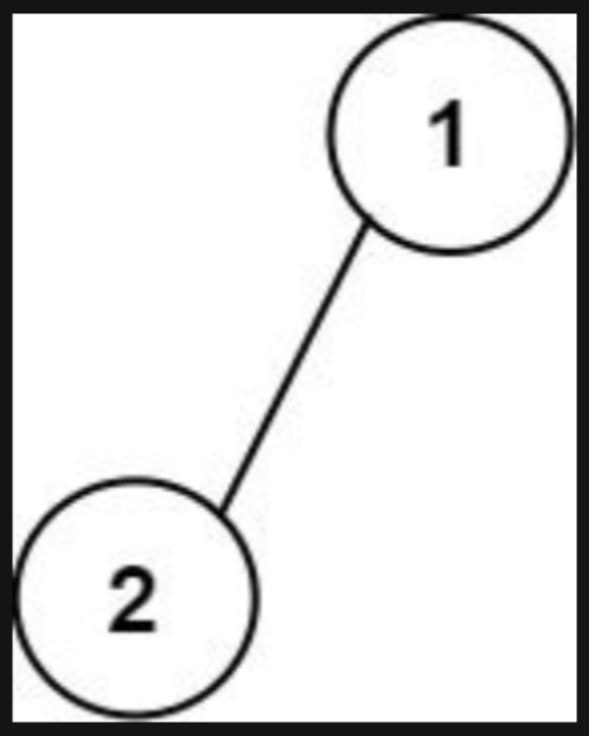
Description

Given the `root` of a binary tree, construct a **0-indexed** `m x n` string matrix `res` that represents a **formatted layout** of the tree. The formatted layout matrix should be constructed using the following rules:

- The **height** of the tree is `height` and the number of rows `m` should be equal to `height + 1`.
- The number of columns `n` should be equal to $2^{height+1} - 1$.
- Place the **root node** in the **middle** of the **top row** (more formally, at location `res[0][(n-1)/2]`).
- For each node that has been placed in the matrix at position `res[r][c]`, place its **left child** at $res[r+1][c-2^{height-r-1}]$ and its **right child** at $res[r+1][c+2^{height-r-1}]$.
- Continue this process until all the nodes in the tree have been placed.
- Any empty cells should contain the empty string `""`.

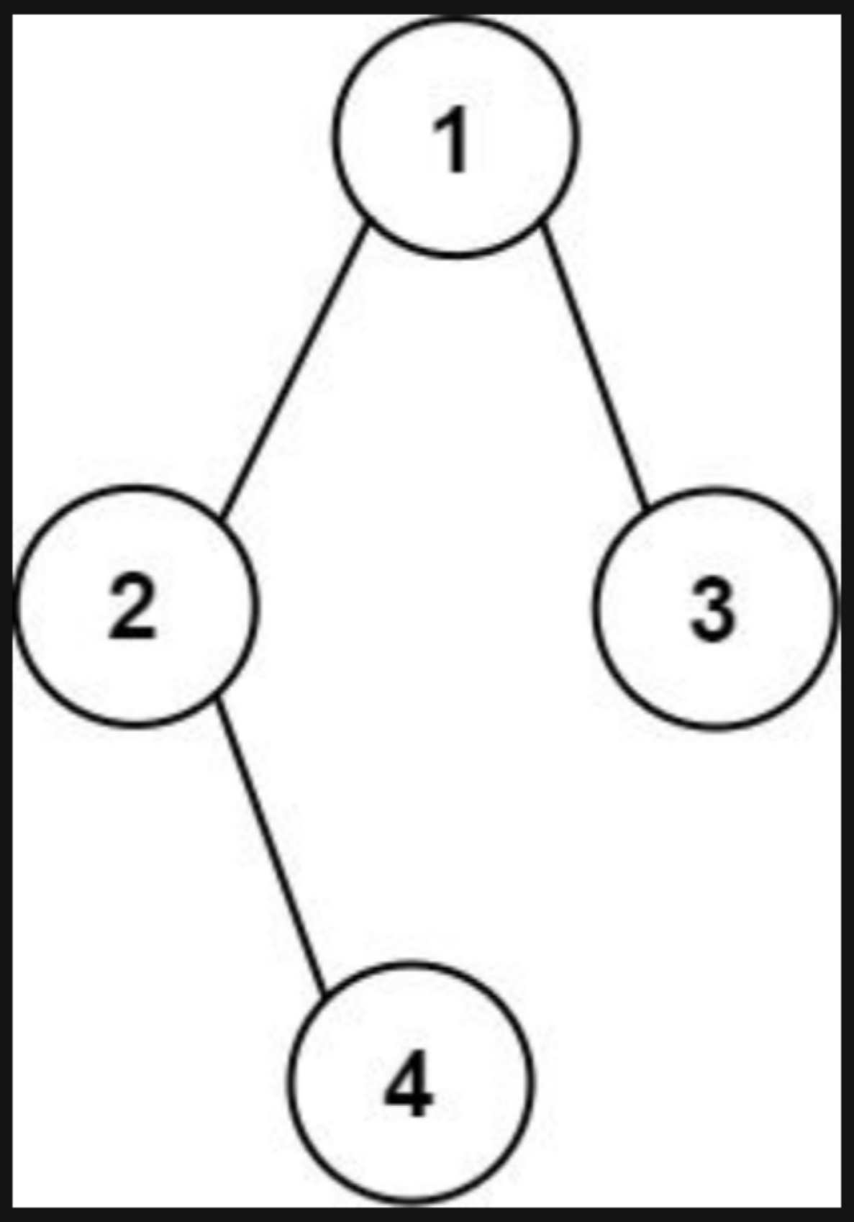
Return *the constructed matrix* `res`.

Example 1:



```
 Input: root = [1,2]
 Output:
[["","1",""],
 ["2","",""]]
```

Example 2:



```
 Input: root = [1,2,3,null,4]
 Output:
[["","","","1","","",""],
 ["","2","","","","3",""],
 ["","","4","","","",""]]
```

Constraints:

- The number of nodes in the tree is in the range $[1, 2^{10}]$.
- `-99 <= Node.val <= 99`
- The depth of the tree will be in the range `[1, 10]`.