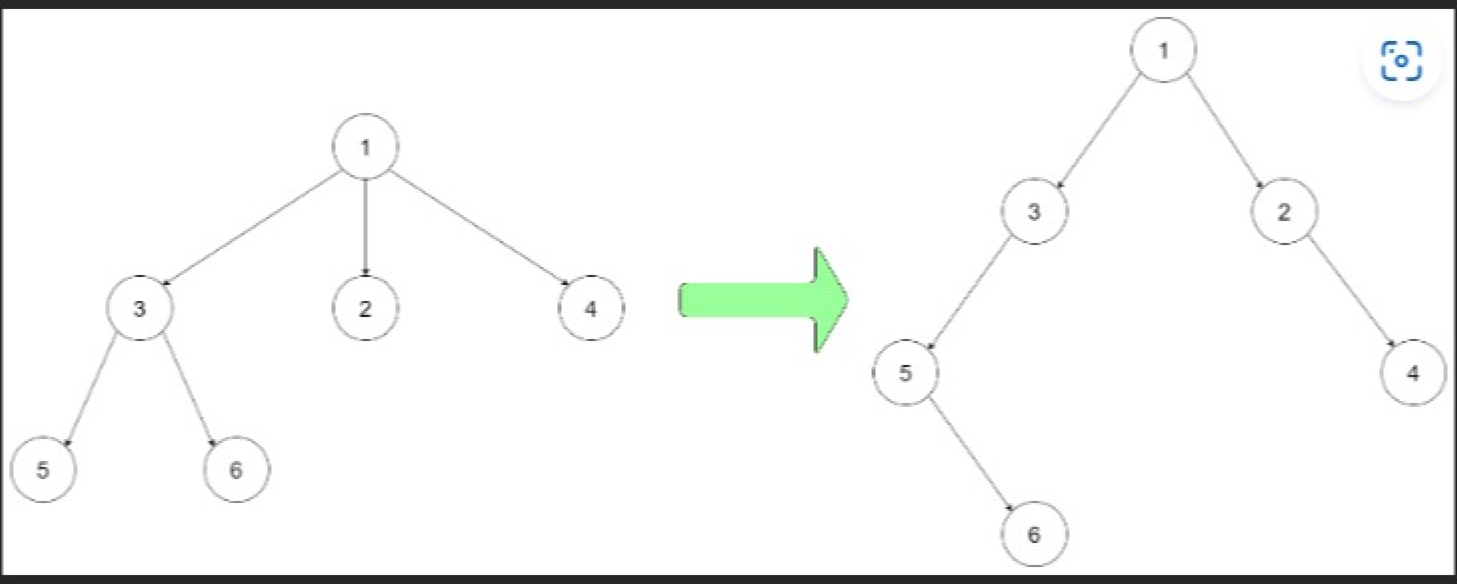
431. Encode N-ary Tree to Binary Tree Premium

Hard   Topics

Design an algorithm to encode an N-ary tree into a binary tree and decode the binary tree to get the original N-ary tree. An N-ary tree is a rooted tree in which each node has no more than N children. Similarly, a binary tree is a rooted tree in which each node has no more than 2 children. There is no restriction on how your encode/decode algorithm should work. You just need to ensure that an N-ary tree can be encoded to a binary tree and this binary tree can be decoded to the original N-nary tree structure.

Nary-Tree input serialization is represented in their level order traversal, each group of children is separated by the null value (See following example).

For example, you may encode the following `3-ary` tree to a binary tree in this way:



```
Input: root = [1,null,3,2,4,null,5,6]
```

Note that the above is just an example which *might or might not* work. You do not necessarily need to follow this format, so please be creative and come up with different approaches yourself.

Example 1:

```
Input: root = [1,null,3,2,4,null,5,6]
Output: [1,null,3,2,4,null,5,6]
```

Example 2:

```
Input: root =
[1,null,2,3,4,5,null,null,6,7,null,8,null,9,10,null,null,11,null,12,null,13,null,null,14]
Output:
[1,null,2,3,4,5,null,null,6,7,null,8,null,9,10,null,null,11,null,12,null,13,null,null,14]
```

Example 3:

```
Input: root = []
Output: []
```

Constraints:

- The number of nodes in the tree is in the range `[0, 10⁴]`.
- `0 <= Node.val <= 10⁴`
- The height of the n-ary tree is less than or equal to `1000`
- Do not use class member/global/static variables to store states. Your encode and decode algorithms should be stateless.

Seen this question in a real interview before? 1/5

Yes   No

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