

## Problem Challenge 2

We'll cover the following ^

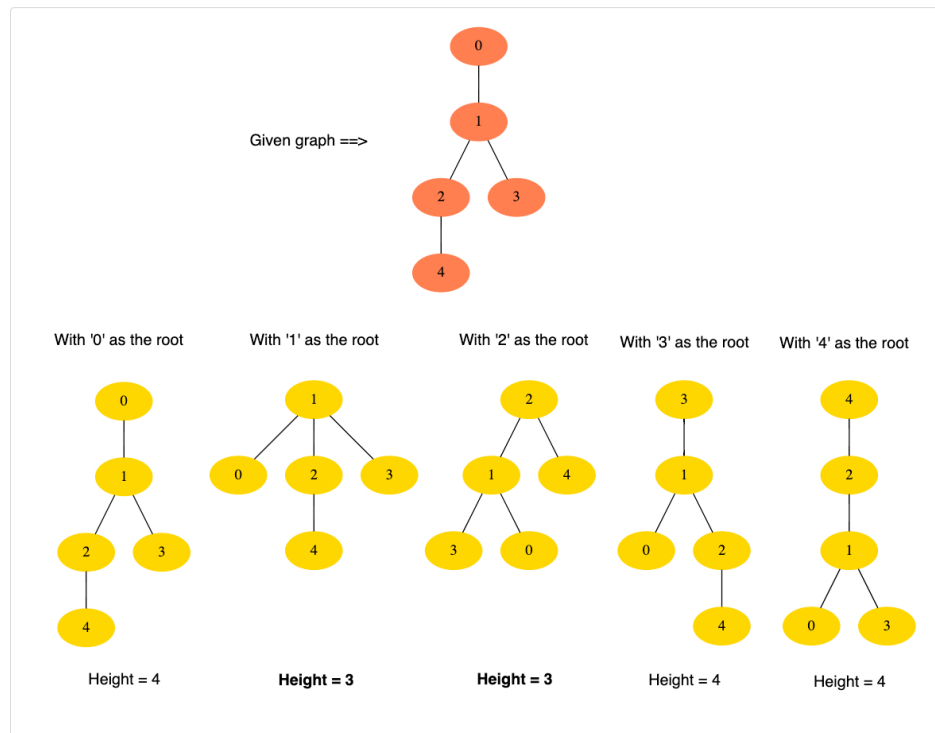
- Minimum Height Trees (hard)
- Try it yourself

### Minimum Height Trees (hard) #

We are given an undirected graph that has characteristics of a **k-ary tree**. In such a graph, we can choose any node as the root to make a k-ary tree. The root (or the tree) with the minimum height will be called **Minimum Height Tree (MHT)**. There can be multiple MHTs for a graph. In this problem, we need to find all those roots which give us MHTs. Write a method to find all MHTs of the given graph and return a list of their roots.

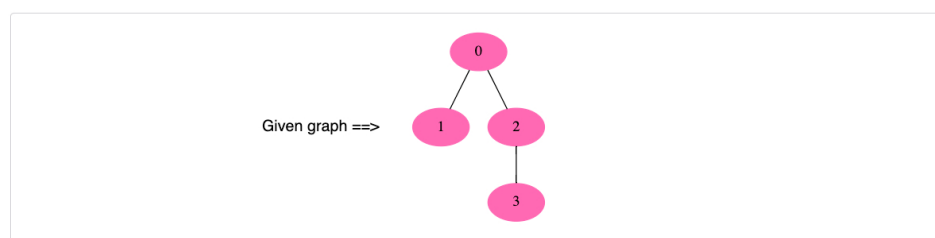
**Example 1:**

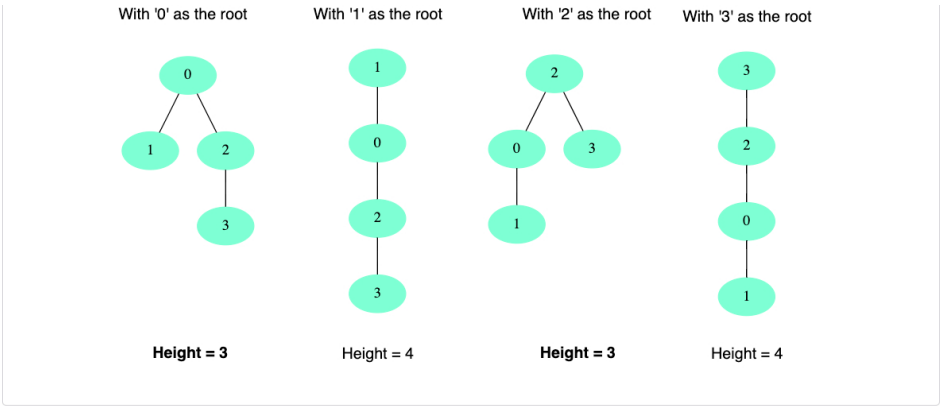
```
Input: vertices: 5, Edges: [[0, 1], [1, 2], [1, 3], [2, 4]]
Output: [1, 2]
Explanation: Choosing '1' or '2' as roots give us MHTs. In the below diagram, we can see that the height of the trees with roots '1' or '2' is three which is minimum.
```



**Example 2:**

```
Input: vertices: 4, Edges: [[0, 1], [0, 2], [2, 3]]
Output: [0, 2]
Explanation: Choosing '0' or '2' as roots give us MHTs. In the below diagram, we can see that the height of the trees with roots '0' or '2' is three which is minimum.
```





Example 3:

```
Input: vertices: 4, Edges: [[0, 1], [1, 2], [1, 3]]
Output: [1]
```

Try it yourself #

Try solving this question here:

Java Python3 JS C++

```
1 import java.util.*;
2
3 class MinimumHeightTrees {
4     public static List<Integer> findTrees(int nodes, int[][] edges) {
5         List<Integer> minHeightTrees = new ArrayList<>();
6         // TODO: Write your code here
7         return minHeightTrees;
8     }
9
10    public static void main(String[] args) {
11        List<Integer> result = MinimumHeightTrees.findTrees(5,
12            new int[][] { new int[] { 0, 1 }, new int[] { 1, 2 }, new int[] { 1, 3 }, new int[] { 2, 4 } });
13        System.out.println("Roots of MHTs: " + result);
14
15        result = MinimumHeightTrees.findTrees(4,
16            new int[][] { new int[] { 0, 1 }, new int[] { 0, 2 }, new int[] { 2, 3 } });
17        System.out.println("Roots of MHTs: " + result);
18
19        result = MinimumHeightTrees.findTrees(4,
20            new int[][] { new int[] { 0, 1 }, new int[] { 1, 2 }, new int[] { 1, 3 } });
21        System.out.println("Roots of MHTs: " + result);
22    }
23 }
```

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Solution Review: Problem Challenge 1

Solution Review: Problem Challenge 2

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