CSE220: Data Structures (Lab)
Fall 2024
Lab Quiz - 05
Duration: 35 Minutes

B

Name:	ID:	Section:

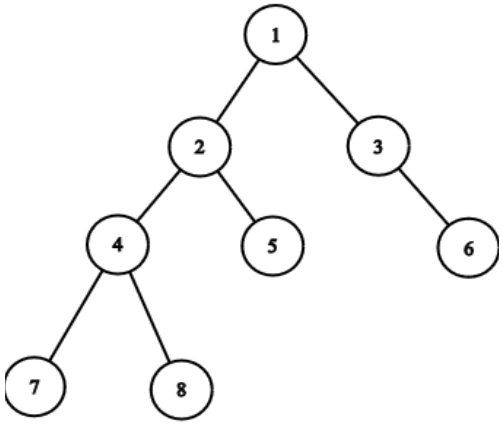
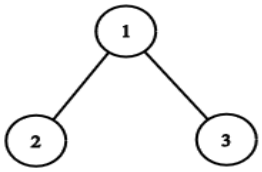
Question 1 [15 Points]

A path in a binary tree is a sequence of nodes that connect a starting node to an ending node, where each consecutive pair of nodes in the sequence is connected by an edge in the tree. In a path, if you select any pair of nodes that are consecutive, the second node will be the child of the first node.

We will call a path *interesting* if no consecutive pairs of nodes in that path have elements with the same parity. In other words, if you select a consecutive pair of nodes from an interesting path, one of them will have an odd element, and the other will have an even element.

In this question, you are given the **root** of a binary tree with multiple nodes. Write a function *count_interesting_paths(root)* that counts the number of paths that **start** from the **root**, **end** at a **leaf** node and are ***interesting*** paths. Assume the tree is constructed, so write only this function.

- Assume the BTNode class is given. You cannot use any other data structures.
- No library functions allowed. You can write as many helper functions as you need.

Sample Input:	**Sample Output:**	**Explanation:**
Input Tree:  	**Output:** **1**	The paths from the root to a leaf node are as follows: **1→2→4→7[not interesting]** **1→2→5 [interesting]** **1→2→4→8[not interesting]** **1→3→6[not interesting]** In the first and third paths, the consecutive nodes 2 and 4 are both even. In the fourth path, consecutive 1 and 3 are odd. The **second** path is interesting. The answer is 1.
Input Tree:  	**Output:** **1**	1→2 is an interesting path, but 1→3 is not, since 1 and 3 are both odd.