GRAPH (BFS)

https://leetcode.com/problems/maximum-level-sum-of-a-binary-tree

Given the **root** of a binary tree, the level of its root is **1**, the level of its children is **2**, and so on.

Return the **smallest level** x such that the sum of all the values of nodes at level x is **maximal**.

```
Input: root = [1,7,0,7,-8,null,null]
```

Output: 2

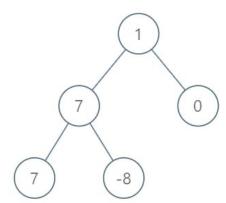
Explanation:

```
Level 1 sum = 1.
```

Level 2 sum = 7 + 0 = 7.

Level 3 sum = 7 + -8 = -1.

So we return the level with the maximum sum which is level 2.



Solution – Maximum Level Sum of a Binary Tree

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```
int maxLevelSum(TreeNode* root) {
std::queue<TreeNode*> nodes;
int currentLevel = 0;
int maxLevel = 1;
int maxSum = INT MIN;
nodes.push(root);
// traverse the graph
while(!nodes.empty()) {
    int levelSum = 0;
    int levelSize = nodes.size();
    currentLevel++;
    // sum the values in current level
    for (int i = 0; i < levelSize; ++i) {</pre>
        TreeNode* node = nodes.front();
        levelSum += node->val;
        nodes.pop();
        if (node->left) nodes.push(node->left);
        if (node->right) nodes.push(node->right);
    if (levelSum > maxSum) {
        maxLevel = currentLevel;
        maxSum = levelSum;
return maxLevel;
```