AlgoExpert

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Prompt | Scratchpad | Our Solution(s) | Video Explanation | Run Code

Solution 1

```cpp
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#include <vector>
using namespace std;

class BinaryTree {
public:
  int value;
  BinaryTree *left;
  BinaryTree *right;
  BinaryTree *parent;

  BinaryTree(int value, BinaryTree *parent = NULL);
  void insert(vector<int> values, int i = 0);
};

// O(n) time | O(1) space
void iterativeInOrderTraversal(BinaryTree *tree,
                               void (*callback)(BinaryTree *tree)) {
  BinaryTree *previousNode = NULL;
  BinaryTree *currentNode = tree;
  while (currentNode != NULL) {
    BinaryTree *nextNode;
    if (previousNode == NULL || previousNode == currentNode->parent) {
      if (currentNode->left != NULL) {
        nextNode = currentNode->left;
      } else {
        (*callback)(currentNode);
        nextNode = currentNode->right != NULL ? currentNode->right
                                              : currentNode->parent;
      }
    } else if (previousNode == currentNode->left) {
      (*callback)(currentNode);
      nextNode =
          currentNode->right != NULL ? currentNode->right : currentNode->parent;
    } else {
      nextNode = currentNode->parent;
    }
    previousNode = currentNode;
    currentNode = nextNode;
  }
}
```