Data Structures - Quiz - 8

Question:

Write a method `public boolean imbalance(Integer key)` that checks if a restructuring is required if you add an entry with key (i.e., if you perform a regular BST addition, will the tree become imbalanced?). Recall the method `private SortEntry<V> nearestNode(Integer key)`.

Solution:

```java
public boolean imbalance (Integer key) {
    SortEntry <V> nearest = nearestNode (key);
    if(nearest.getLeft() != null || nearest.getRight() != null || nearest.
        getKey().equals(key)) return false;
    SortEntry <V> current = nearest;
    SortEntry <V> temp = nearest;
    int nearestheight = nearest.getHeight();
    nearest.setHeight(nearestheight+1);
    while(current.getParent() != null) {
        recomputeHeight(current);
        if(isBalanced(current, current.getParent()) == false) {
            nearest.setHeight(nearestheight);
            while(!temp.equals(current)) {
                recomputeHeight(temp);
                temp = temp.getParent();
            }
            return true;
        }
        current = current.getParent();
    }
    nearest.setHeight(nearestheight);
    while(!temp.equals(root)) {
        recomputeHeight(temp);
        temp = temp.getParent();
    }
    return false;
}
```