## CS163 Test Plan

**Develop the test plan:** *For each member function that you plan to write, think about how to test it – what flow of control exists in the member function and how would you test out all conditions:*

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| --- | --- | --- |
| **Test Case(s)** | **Expected Result** | **Verified?**  **(yes/no)** |
| **Add a new element to empty BST** | **BST’s root is set to new element, rtn true** | **Y** |
| **Add a new element to a BST greater than all other elements** | **BST adds new element to very-right side, rtn true** | **Y** |
| **Add a new element to a BST lesser than all other elements** | **BST adds new element to very-left side, rtn true** | **Y** |
| **Add a new element to a BST which is neither greatest nor least** | **BST properly traverses to correct leaf, assigning node to correct position, rtn true** | **Y** |
| **Remove an element from a leaf** | **Leaf is deleted, rtn true** | **Y** |
| **Remove an element from a node with 1 child** | **Remove whole node, connect prior to child, rtn true** | **Y** |
| **Remove an element from a node with 2 children, with right child that has no left children** | **Copy right child’s data, then delete right, rtn true** | **Y** |
| **Remove an element from a node with 2 children, where right child has 2 children** | **Find inorder successor, copy its data to current node, then delete successor, assigning its children to its parent, rtn true** | **Y** |
| **Remove an element from BST that doesn’t exist** | **Rtn false** | **Y** |
| **Get height of empty tree** | **Rtn 0** | **Y** |
| **Get height of tree with height of n** | **Rtn n** | **Y** |
| **Display a range of elements in a tree** | **Display all elements that fit range, rtn true** | **Y** |
| **Display a range of elements in an empty tree** | **Display nothing, rtn false** | **Y** |
| **Attempt to display an element that does not exist** | **Display nothing, rtn false** | **Y** |
| **Get value of is\_efficient() for balanced tree (height difference is no greater than 1)** | **Rtn true** | **Y** |
| **Get value of is\_efficient() for balanced tree (height difference is greater than 1)** | **Rtn false** | **Y** |

**Verify correctness:** Using the above test plan, create a test program that tests the interactions of all functions together.