Program 4 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:*

Test Case(s)	Expected Result	Verified? (yes/no)
Binary_search_tree:		
Insert:		
Inserting a single item on an empty BST	The data is inserted as the root	Yes
Inserting multiple items with the same Search key	Subsequent items are branched to the right	Yes
Inserting multiple items with different search keys	Each item is inserted at the correct leaf	Yes
Erase:		
Erase with a non-matching search key	Returns false, BST is unchanged	Yes
Erase a leaf	Returns true, item is deleted	Yes
Erase a node with one child	Returns true, the node's parent adopts the child	Yes
Erase a node with two children	Returns true, the in-order successor overwrites the node.	Yes
Find:		
Find with a non-matching search key	Returns the default object	Yes
Find with a matching search key	Returns a reference to the matched object	Yes
Clear:		
On an empty tree	Nothing, BST is unchanged	Yes
On a populated table	Post order traversal deletes each node	Yes
Size:		
On an empty table	Returns 0	Yes
On a BST with 'N' elements	Returns N	Yes

Empty:		
On an empty BST	Returns true	**Yes**
On a populated BST	Returns false	**Yes**
Begin:		
On an empty BST	Returns a NULL iterator	**Yes**
On a populated BST	Returns an iterator to the smallest element in the tree	**Yes**
Incrementing a begin iterator	Iterators points to the next larger element	**Yes**
End:		
On an empty/populated hash table	Returns a NULL iterator	**Yes**
Height:		
On an empty tree	Returns 0	**Yes**
On a tree with one element	Returns 1	**Yes**
On a tree with N elements	Returns the number of nodes on the longest path	**Yes**
# Item_table:		
Item_tables add, remove, and get item methods are wrappers for the binary_tree's insert, erase, and find functions. The unit tests for those functions have already been outlined above		
Display_all:		
On an empty table	Displays nothing	**Yes**
On a populated table	Displays each item object to the console	**Yes**

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