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Project 2

**Testing Strategy**

In this program, the insert\_at\_root() and remove() function did not work.

First, test unsigned int type for key, and char for value.

1. When the tree is empty, test search(), is\_empty(), size(), print() fuctions. search() and print() will throw exceptions. The print() function will be used for other tests, so I have to make sure it is correct.

2. Test insert() function. It will randomly generate a number, if it equals to 0, it will insert at root, otherwise, it will insert at leaf. However, the insert\_at\_root() does not work, so I set the random number to 30 to make sure it will call the insert\_at\_leaf all the time for testing. I inserted to function.

3. Now the list is not empty, test the is\_empty(), size() again, and test capacity(), load().

4. Test search() with one in the map, and the other not in the map.

5. Test the clear() function, and use size() function to check.

Second test double for key and value. However, in the search function, a reference was passed, and it doesn’t work for double.