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# TSTL Progress Report

During the course of testing I have focused on testing on different modules of the binary search tree and as well the linked list data structure. I have tested almost all the modules of the linked list and reported the bugs identified below. Additionally, I have also tested many of the modules in the Binary Search tree data structure library and reported my findings below.

**Bugs Found in System Under Test**

- Binary Search Tree:

  There are no bugs found in this System up till now.

- Linked List:

  There were few bugs/faults found in the System

  - Size declared as member variable and function name hence function would not return right value
  - Cases for empty Linked Lists are not handled by the remove and search function

**Progress:**

- Binary Search Tree:

  **Quality of System Under Test:**

  The Binary Search Tree script as of now does not report any bugs to be noted after rigorous testing. Compared to the beginning the test scenario has been improved by generating more test cases for more modules in the system.

  **Previously:**

  -Test cases only focused on simple condition on insertion and deletion of values in the tree

  **Currently:**

  -Size of the tree and property of tree is validated to be the same when an existing key is inserted.

  -Size of tree and BST property is checked when tree is empty and delete method is Invoked.

  -The keys method is checked where all the keys that exist in the tree are returned

-The Max_key method is checked which return max key in the tree. Including the condition when the tree is empty.

-The Min_key method is checked, which returns the minimum most key in the tree. Including the condition when the tree is empty.

**Code Coverage:**

I achieved 44% code coverage in this data structure testing and covered 80 of the 111 branch statements.

- Linked List:

**Quality of System Under Test:**

The Linked List source being tested. Performs its operations under normal circumstances well. But its operations such as search and remove fail to handle the boundary condition, which is when the tree is empty.

Compared to the beginning the test scenario has been improved by generating more test cases for more modules in the system.

**Previously**

- No tests were made on this data structure system.

**Currently**

- Size of the Linked List is checked after insertion. Size function is validated and the search function is validated after the aforementioned action.

- Size of Linked list is checked when value is deleted. Including the condition when the tree is empty. Additionally the search function is validated and the size function is tested after the aforementioned action.

- Search and size module is also tested when the tree is empty.

**Code Coverage:**

I have achieved roughly 60% of code coverage and have covered about 40 branch statements.

In conclusion, I have covered many of the properties that are adhered in the Binary Search Tree and Linked List data structure. Additionally I am in the process of testing the performance of these two data structures against each other. Based on threshold values, I plan to check how they perform their operations such as insert, delete, search etc. Also if time permits, I would test another data structure as well.