

Bug Report

Xu Zheng

1. Description of the bug

I have tested three data structures: queue, stack and singly linked list. I just find a bug for all the three data structures right now. The detail of the bug is as follows.

All the three data structures have the remove() function. And the bug is found in this function. I found that if the queue, stack or the linked list is empty, the system would fail the test when the remove() function be called. To be more specific, let me take the singly linked list for example. The remove() function for this data structure will return a boolean value when it is called. It means that if the return value is true, then the element has been removed successfully. Otherwise, the element need to be removed has not been found in this list. But in my test, if the linked list is empty and I called the remove() function, the system will fail the test. It means that I can't get the return boolean value which should be false. And the same problem happens in other two data stuctures.

2. Explanation of the progress

In my first version of the TSTL codes, I did not find any bugs. So I made some improvements for the testing codes afterwards. Then I successfully found the bug that is described above. The improvements are I added more actions in the TSTL codes. It turns out I did not found any bugs at first because of the actions are thoroughly considered. In other words, I set too many constraints for the actions. It means that the opportunities of finding the bug have been filtered. At my latest version of the TSTL code, the actions added are not so considered. So that the possibility of finding the bug has been increased. At last, I find the bug.

Version of TSTL Codes	Bugs Found/Not Found	Date
First Version	No Bug Found	Feb 20th
Second Version	A Bug Found	Mar 1st

3. Estimation of the progress

Until now, I already tested three data structures and found a bug. In the following work, I need to test several sorting algorithms and one more data structure – Binary Search Tree.

As for the binary search tree, the testing can be done very soon since I already tested three other data structures. Since there is a bug in the three data structures, I think I would find some bugs in the binary search tree. During the following work, I will focus on testing the sorting algorithms modules. Actually I already tried to test some of them. But the way I tested them in is very simple. I just checked the correctness of the algorithms by comparing the actual output and the expected output. By the end of the term, there is no doubt I will finish all the testing include data structures and sorting algorithms modules. And probably I will not find any bugs in the sorting algorithms.

4. Discussion of the quality of the SUT

Since I just finished testing three data structures of the whole library, it is hard to define the quality of the system under test right now. According to the testing results I got, I think the quality of the SUT is not satisfied but acceptable. Though there is a little bug, the general function of the library can work properly.

5. Code coverage

At my first version of TSTL codes, the code coverage is very low (less than 20 percent). After I added more actions into the codes, the code coverage has been increased obviously (more than 50 percent).