Bugs Report

In this project, I find a bug about my system under test python file. In the first function create_by_head (self, datas), I write a tstl function to test whether it can successfully insert a list into the Linklist.

“Node(data[0])” Bug

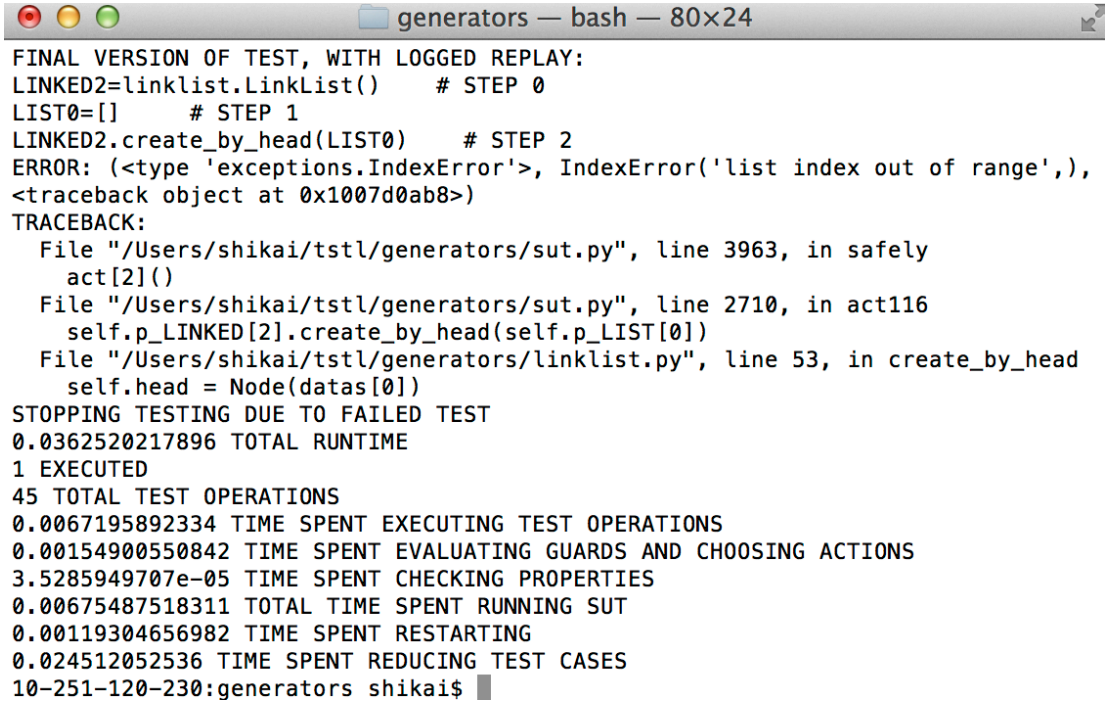
First, I defined the length function in the tstl file because my test python file has no function to get the size or length of the Linklist. So, I defined a function called length(self) to get the length of the Linklist.

Test Function:

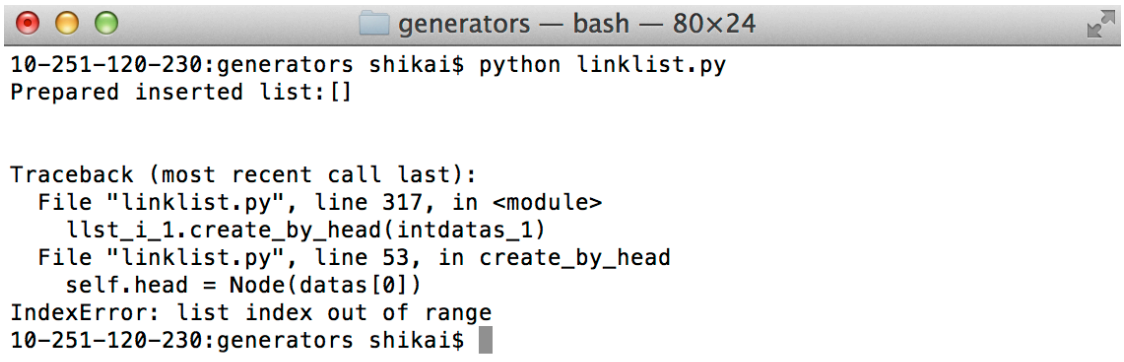
~<LINKED>.create_by_head(<LIST>) => (length(<LINKED,1>) ==
PRE<(len(<LIST>))>)

In the test function, LINKED is the target Linklist, LIST is the list we want to insert. First we initial a empty list and randomly append <INT> in the list. Then length of LINKED should be equal to the length of LIST we get because the LINKED is empty at the beginning. So, if two length equal, it means we insert successfully.

When I test this function, I initialize the empty <LIST>:[ ], then, appending <INT> in the LIST. When executing create_by_head function, it would report bug. I called it “Node(data[0])” bug.

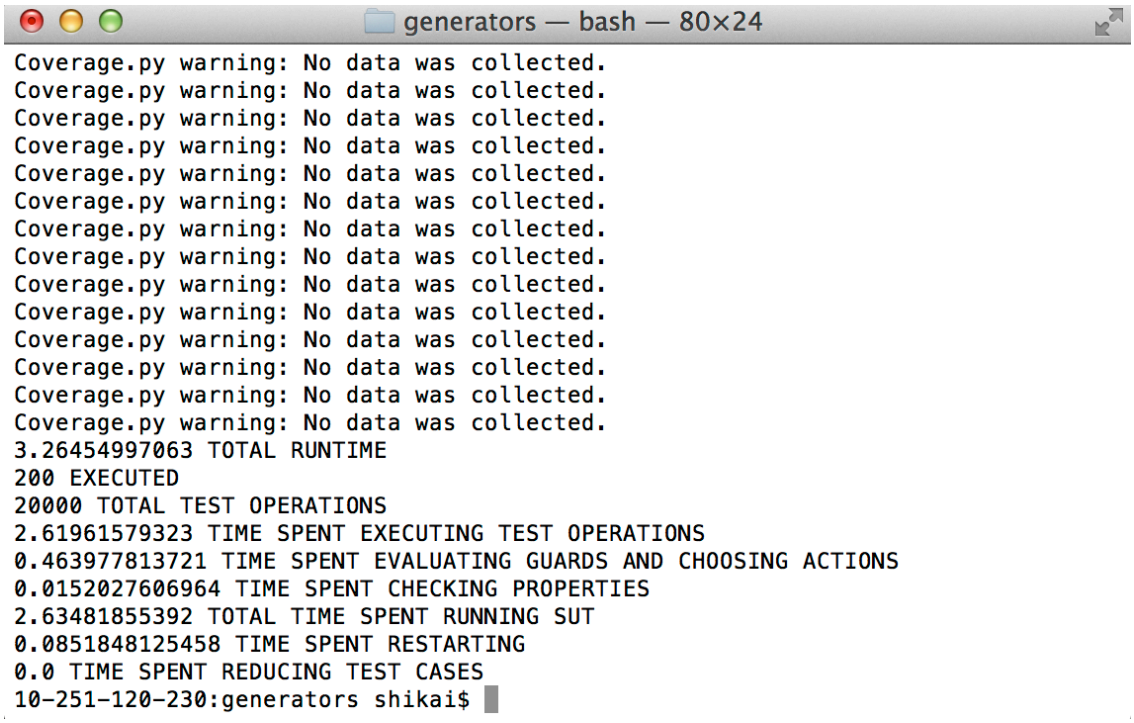


It says when we insert an empty list in the Linklist, it would crashed due to the Node(datas[0]). So, I write a print function in python file to print the result of inserting empty list. It also crashed and reported bugs like this:



Therefore, it is the bug of this python file. Then, I analysis the reason it report this bug. I see in the create_by_head(self, datas) function, the author first define self.head = Node(data[0]), but he does not consider when datas is empty. When datas is empty, data[0] would be empty too, and head would also be empty. This function would failed. That's the reason why it cannot insert empty list to the Linklist.

So, I changed <LIST>: = [] to <LIST>: = [1,2]. It means I initialize the list as [1,2] rather than empty. It can insert list successfully.



That's the first bug I found in this project. Also, the same bug would appear in the create_by_tail(self, datas) function.

The second bug of the python file is the clear() function. It also caused by "Node(data[0])" bug. I thought after executing clear() function, the length of LINKED should be 0. So, I write this: ~<LINKED>.clear() => (length(<LINKED,1>) == 0). But it would report bug, which says length(<LINKED,1>) not equals 0. So, I thought in this file, when it is init, it defined self.head = Node(0). So, its length is at least 1 at the

beginning. So, I should write (length(<LINKED,1>) == 1). It can be executed. But in fact, when we clear a Linklist, the length should be 0. If this is the black box test, the function would be considered as failed. But in this project, I have read his codes, so I consider it successfully clear the whole Linklist.

Progress

Last time I have only finished testing create_by_head function. This time, I have finished testing create_by_tail, clear(), is_empty(), getData_by_index() functions.

For the is_empty(), getData_by_index() function I didn't find any bugs. To test is_empty function, I let a = ~<LINKED>.is_empty(), then check whether a is Ture or False.

For getData_by_index(), I executed create_by_head first, then change the random list to a fixed list. Then, I checked getData_by_index(0) whether it equals to the first data of the list. Also, I checked index(1000), whether it equals to False.

Progress by end of term and coverage

By the end of term, I will finish the other six functions about the Linklist. I will define some other functions in tstl file to test these functions. In the end, I'm going to cover more than 50 percent codes. Also, I noticed a small bug about the tstl and I need to test more to make sure. And I will include it in the final report if it corrects.

Quality of the SUT

The quality of the SUT is between poor quality and well done. Because his initialize function is not good. He didn't consider when list need to be inserted is empty, what should codes do. However, it is not a big problem because this function can still insert non-empty list into the Linklist. And other functions like getData_by_index, he writes well. No more bugs found until now. "Node(data[0])" is the only bug I found now.