Proposal of Project

CS562

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1. Identify a Python library
   For this project, I plan to use the TSTL tool to test the data structure in Python called LinkedList. The file I used is from somebody else in the Github. The file can be downloaded with the following link:
   https://github.com/mirob2005/Python_Data_Structures/blob/master/LinkedLists/LinkedList_Circular.py
   This data structure is a very important structure because each element in the linked list is separate objects. In this way, we don't need to put all the data next each other. For this one, it is a circular linked list.We can use pointer to find every node and it will reduce the running time.

2. What functions in this python file.
   There are many functions in the python file, I will introduce some of them for the future test.
   Insert,

   ```python
   self.head = CircularNode(data,None,None)
   self.head.next = self.head
   self.head.prev = self.head
   self.tail = self.head
   ```

   this function used in the beginning of the linked list, it will add the data to the list. I will test to make sure all the items are added correctly. This is the foundation for the linked list.
   Returnindex, this function is like the print function. It will show all the data in the linked list.
   Updateindex,

   ```python
   ptr.data = data
   return True
   currentIndex+=1
   ptr=ptr.next
   ```

   this is update the index in the linked list. It can check if the index is in the correct position.

Deleteindex,
```python
self.head = self.head.next
ptr.next = None
ptr.prev = None
self.head.prev = self.tail
self.tail.next = self.head
```
this function is used to delete the index.

Insertbeforeindex, this will add the new data before the index we already known. Maybe this is the only data we know.

Insertafterindex, the same as insertbeforeindex, but add the data after the known index.

Deletedata, this will delete the data in the index.

Deleteptr, this will delete the ptr, the ptr is used for find the beginning of the list.

Insertaftereverydata,
```python
ptr.next = CircularNode(dataToInsert,ptr.next,ptr)
if(ptr == self.tail):
    self.tail = ptr.next
ptr.next.next.prev = ptr.next
success = True
ptr = ptr.next
ptr = ptr.next
```
this can add data after all data, in the end of the linked lise.

Insertbeforeeverydata, the same as previous one but add in the beginning of the list.

Deletelist, this will delete the linked list.

Copylist, this will copy the linked list.

And the last function findMthToLastnode, this function can find part of the linked list.

3. What I will test
For this python file, I will test all the functions to find out if them works or not.

In addition, I will also test if there has the same data in different index and I call deletedata, what will happen. What if all the index contains the same data? What if I try to delete the index in the null list. For the insert, I will also test if the linked list can insert a integer to a char list. For the insertaftereverydata, what if there is an null index after the data? Is there a limit for the length of the data? How about the list? Is the list connect correct as a circle.