

Assignment 4 Report

Question 1

1. This code is saved in q1.py
2. This program can count the length of a singly linked list, recursively.
The list should follow the rule of "Singly Linked List".
The output is showing an example of the program's operating mechanism.
3. Execute as followings:

```
def main():  
    LinkedList = SinglyLinkedList()  
    for i in range(4):  
        LinkedList.insert(i)  
    count = LinkedList.recursive_count(LinkedList.head)  
    print("The length of the list is '%s'"% count)
```

The length of the list is '4'

Question 2

1. This code is saved in q2.py
2. This program can sort a randomly generated singly linked list and show the first node's element after the list is sorted.
The list can be initially arranged to any orders.
The output is an example of the program's operating mechanism.
3. Execute as followings:

```
def main():  
    queue = SinglyLinkedList()  
    lst = [5,2,3,9,8,7,10,13,26,1]  
    for i in lst:  
        queue.insert(i)  
    head = queue.quick_sort(queue.head)  
    now = head  
    while now != None:  
        print(now.element,end=' ')  
        now = now.pointer  
    print()
```

1 2 3 5 7 8 9 10 13 26

Question 3

1. This code is saved in q3.py
2. This program is a Hanoi Tower game. It allows the user to set the initial number of disks.
All the data should be positive integers.

The output would be every step to put all the disk from Tower A to Tower C.

3. Execute as followings:

```
Enter the number of disks:3  
A --> C  
A --> B  
C --> B  
A --> C  
B --> A  
B --> C  
A --> C
```