Report for Assignment 4

Question 1

1. This code is saved in q1.py
2.
   a) The program is two classes containing a method named recursive_count which recursively counts the number of nodes in a singly linked list.
   b) The input is a reference pointing to the first node of the linked list.
   c) The output is the number of nodes in the linkedlist.
3. Execute as followings:

```
a = SinglyLinkedList()
a.insert(11)
a.insert(450)
a.insert(4)
a.insert(767)
print(a.recursive_count(a.head))
```

```
C:\Users\王禹杭\Desktop\120090246.zip>
C:/Users/王禹杭/AppData/Local/Programs
/Python/Python39/python.exe c:/Users/
王禹杭/Desktop/120090246.zip/q1.py
4
```

Question 2

1. This code is saved in q2.py
2.
   a) The program can show the emirp (prime spelled backward) whose reversal is also a prime not including palindromic prime
   b) Input: A reference pointing to the first node of a linked list.
   c) Output: A reference to the first node of a linked list, in which the data have been sorted into the ascending order.
3. Execute as followings:

```
a = SinglyLinkedList()
a.insert(11)
a.insert(0)
a.insert(22)
a.insert(3)
print(a.quick_sort(a.head))
```

```
C:\Users\王禹杭\Desktop\120090246.zip>
C:/Users/王禹杭/AppData/Local/Programs
/Python/Python39/python.exe c:/Users/
王禹杭/Desktop/120090246.zip/q2.py
3
```

Question 3

1. This code is saved in q3.py
2. The program is to show the steps to move all the disks from rod A to rod C via rod B, following the rules:
   (1). Only one disk can be moved at a time.
   (2). Disk can only be moved if it is the uppermost disk on a stack.
   (3). No disk may be placed on top of a smaller disk.
   Users can input the value: the number of disks wanted.
   The output is the steps to move all the disks from rod A to rod C via rod B.

3.Execute as followings:

```
C:\Users\王禹杭\Desktop\120090246.
zip>C:/Users/王禹杭/AppData/Local/
Programs/Python/Python39/python.ex
e c:/Users/王禹杭/Desktop/12009024
6.zip/q3.py
A --> C
A --> B
C --> B
A --> C
B --> A
B --> C
A --> C
```