

Lab#30

Example#1: Write a program to create a singly linked list, then apply the bubble sort algorithm to arrange the items in ascending order.

Solution:

```
1  class Node:
2      def __init__(self, item=None, next=None):
3          self.item = item
4          self.next = next
5
6  class SLL:
7      def __init__(self, start=None):
8          self.start = start
9
10     def insert_at_start(self, item):
11         temp = self.start
12         n = Node(item, temp)
13         self.start = n
14
15     def isempty(self):
16         return self.start is None
17
```

```
18     def insert_at_last(self, item):
19         temp = self.start
20         n = Node(item)
21         if self.isempty():
22             self.start = n
23         else:
24             while temp.next is not None:
25                 temp = temp.next
26             temp.next = n
27
28     def print_list(self):
29         temp = self.start
30         while temp is not None:
31             print(temp.item, end=' ')
32             temp = temp.next
33
```

```
35     def bubble_sort(self):
36         if self.start is None:
37             return
38
39         end = None
40         while end != self.start:
41             p = self.start
42             while p.next != end:
43                 q = p.next
44                 if p.item > q.item:
45                     p.item, q.item = q.item, p.item
46                 p = p.next
47             end = p
48
49
```

```
49
50 mylist = SLL()
51 mylist.insert_at_start(45)
52 mylist.insert_at_start(95)
53 mylist.insert_at_last(58)
54 mylist.insert_at_start(195)
55 mylist.insert_at_last(100)
56 mylist.insert_at_last(190)
57 print("Original list:")
58 mylist.print_list()
59 mylist.bubble_sort()
60 print("\nSorted list:")
61 mylist.print_list()
```

Output:

```
Original list:  
195 95 45 58 100 190  
Sorted list:  
45 58 95 100 190 195
```

Class Assignment

Q.1: Write a program to create a doubly linked list, then apply a sorting algorithm (except the bubble sort algorithm) to arrange the items in ascending order.