**Wentworth Institute of Technology**

**Department of Computer Science and Networking.**

**Comp 2000 Data Structures Fall 2019**

**Lab #6 Sorted List**

Either

1. Finish implementation of SortedLinkedList as subclass of LinkedList as explained at the beginning of 06eEfficientSortedList (25 pts)

Or (more points, but requires more work)

1a) Create a LinkedList and a SortedLinkedList as subclasses of LinkedChainBase: finish implementation shown in 06eEfficientSortedList (35 pts)

1. (Application). (75 pts)

In certain computer networks, a message is not sent as a continuous stream of data. Instead, it is divided into pieces, called *packets*, and sent a packet at a time. The packets might not arrive at their destination in the same sequence as the one in which they were sent. To enable the receiver to assemble the packets in their correct order, each packet contains a sequence number.

For example, to send the message “Meet me at 6 o’clock” three characters at a time, the packets would appear as follows:

|  |  |  |
| --- | --- | --- |
| 1 Mee |  | 3 e a |
| 2 t m | but arrive as | 4 t 6 |
| 3 e a |  | 1 Mee |
| 4 t 6 |  | 5 o’ |
| 5 o’ |  | 2 t m |
| 6 clo |  | 6 clo |
| 7 ck |  | 7 ck |

Regardless of when the packets arrive, the receiver can order the packets by their sequence number to determine the message.

Given a text file containing the packets in order they were received, write an application that reads the file and extracts the message by using a SortedList. Design and create auxiliary classes such as Packet and Message. You need to make Packet implement Comparable <Packet>, i.e implement compareTo method.