Data Structures and Algorithms

Homework #1

Due date 23.11.2023

Use the Node and LinkedList class we coded in the class to solve this homework. You can add methods into the LinkedList class. You can assume that there are at least 10K values in the txt files.

a) Source.txt file with the format of; 2,3,45,6,12,5,3... will be provided to you. Create a LinkedList using these values. The order of the values should be as same as the one in the file. Insert every new value to the end of the list if it was not ALREADY inserted.

b) Search.txt file again contains the values in the same format; 2,45,22,3,2,2,2,6,5,4,5,3,3... will be provided to you. Search each of these values in the Linked List you have created. You will find the total and average number of memory accesses to search all the values exists in the search.txt file. Accessing each node counts as one memory access.

c) Again Search.txt file again contains the values in the same format; 2,45,22,3,2,2,2,6, 5,4,5,3,3... will be provided to you. Search each of these values in the Linked List you have created. BUT this time you will modify the list by bringing the searched value into the beginning of the list. .(If you search 4 in a list 2->3->4->5, the list becomes like this; 4->2->3->5). Again you will find the total and average number of memory accesses to search all the values in the search.txt file. Accessing each node counts as one memory access.

d) Compare two methods in terms of time to finish all searches.

e) Can you design a method that will perform better in terms of search performance. If you can, do it and compare with others.