

Assignment 6

INFORMATION ARCHITECTURE, FALL 2019

DUE : 10:00 AM SATURDAY, NOVEMBER 9

Problem 1. Write a function that searches a given value in a given singly linked list without header and trailer. The function should return **True** if the value is present in the linked list **False** otherwise.

```
def search(H, value): # H is the head node of the list
    # implement this function
```

Problem 2. Assume that all elements in the singly linked list L without header and trailer nodes are integers. Write a function that returns the sum of all elements of L. If the list is empty, just return 0.

```
def sum_list(H): # H is the head node of the list
    # implement this function
```

Problem 3. Give a complete implementation of the queue using a singly linked list that includes a header and a trailer. You may reuse the class `LinkedList` in the Lecture 7 notebook.

Problem 4. Consider two doubly linked lists L1 and L2 with header and trailer nodes. Write a function for concatenating two lists. The result must contain all the nodes of L1 followed by all the nodes of L2. Implement the function with an $O(1)$ complexity method.

- input : L1 ($H1 \rightleftharpoons L1 \text{ nodes} \rightleftharpoons T1$) and L2 ($H2 \rightleftharpoons L2 \text{ nodes} \rightleftharpoons T2$)
- output : $H1 \rightleftharpoons L1 \text{ nodes} \rightleftharpoons L2 \text{ nodes} \rightleftharpoons T1$

```
def concatenate_list(H1, T1, H2, T2):
    '''
    H1 is the header node of L1
    T1 is the trailer node of L1
    H2 is the header node of L2
    T2 is the trailer node of L2
    '''
    # implement this function
```