



Sukkur IBA University Khairpur Campus

Data Structures (Fall 2024)

Assignment 01

Single Linked List

1. Write a function to get the nth node from the end of the linked list.

Function name: `int nthFromLast(int n);`

Case-1: (List Empty) Head=NULL then return LIST_EMPTY

Case-2: (List Non-Empty) Head != Null then return nth element from the end of list

Example

Input: 10 -> 20 -> 30 -> 40 -> 50, `n = 2`

Output: 40 (From the last, second node contains the data 40)

2. Write a function to sort the given single linked list. (Don't swap the data present in the nodes, swap the nodes itself.)

Function name: `void sort();`

Case-1: (List Empty) Head=NULL then return LIST_EMPTY

Case-2: (List Non-Empty) Head != Null then swap the nodes to sort them

Example

Input: 50 -> 40 -> 30 -> 20 -> 10

Output: 10 -> 20 -> 30 -> 40 -> 50

3. Write a function to reverse the single linked list.

Function name: **void reverse();**

Case-1: (List Empty) Head=NULL then return LIST_EMPTY

Case-2: (List Non-Empty) Head != Null then reverse the list

Example

Input: 50 -> 40 -> 30 -> 20 -> 10

Output: 10 -> 20 -> 30 -> 40 -> 50

4. Write a function to remove the duplicates data present in the single linked list.

Function name: **void removeDuplicates();**

Case-1: (List Empty) Head=NULL then return LIST_EMPTY

Case-2: (List Non-Empty) Head != Null then remove duplicate elements

Example

Input: 5 -> 3 -> 4 -> 5 -> 2 -> 1 -> 4 -> 5 -> 3

Output: 5 -> 3 -> 4 -> 2 -> 1