Data Structures Lab - Fall 2020

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Practice Set 1

Q#1 Let's say you have a linked list. You swap the left side element from the right side.
In order to determine the left and right you need to find the midpoint of the linked list.

Example:

Input List: 1->2->3-4>-5>6->7->8->9

Midpoint: ceil(total-length/2) = ceil(9/2) = 5

Output**:** 6->7->8->9->5->1->2->3-4

Q#2 Let's say you have a circular character linked list. You need to find the number of words in a list.

Example:

H->e->l->l->o-> ->e->v->e->r->y->b->o->d->y-> ->h->o->w-> ->a->r->e-> ->y->o->u

Words Count: 5 words are given in this character linked list

Q#3 Assume there is a single linked list. You need to shift the linked list to right by N time.

Examples:

Let's say N is 3 so you need to shift the list 3 times to the right.

Input List = 6->7->8->9->10->11
Shifted List: 9->10->11->6->7->8

Let's say N is 2.

Input List = 1->2->3->4->5
Shifted List: 3->4->1->2->5

Q#4 Ordering of nodes based on even and odd **positions.**

The nodes on odd positions will come first and nodes on even positions will follow them.

Example:

Input: 4-2-5-6-7->8->9
Output: 4->5->7->9->2->6->8

Q#5 You are given a linked list. You have to check whether it's in Ascending, Descending form or is Unsorted.

Examples:

Input: 5->2->7->8->4
Output: Unsorted

Input: 23->17->12->6->3->1
Output: Descending

Q#6 You are given a linked list. User will give you the index, you have to sum the 3 values of nodes starting from the index. Handle problem cases carefully.

Examples:

Index: 3
List: 3->7->4->1->8->9
Sum: 18

Index: 4
List: 3->7->4->1->8->9
Sum: 17

Q#7 You are given a linked list. Find the number of repeated values in it if any.

Examples:

List: 1->3->1->4->2->2->3->5->3
No. of repeated values: 3

List: 1->3->1->4->2->5->7
No. of repeated values: 1

Note: Solve all Grand Task questions as well.