Assignment - 41

DSA Singly and Doubly and Circular Linked List

1. Given a linked list and a key ‘X‘ in, the task is to check if X is present in the linked list or not.
   Examples:
   Input: 14->21->11->30->10, X = 14
   Output: Yes
   Explanation: 14 is present in the linked list.
   Input: 6->21->17->30->10->8, X = 13
   Output: No

2. Write a function that takes a list sorted in non-decreasing order and deletes any duplicate nodes from the list. The list should only be traversed once.
   For example if the linked list is 11->11->11->21->43->43->60 then removeDuplicates() should convert the list to 11->21->43->60.

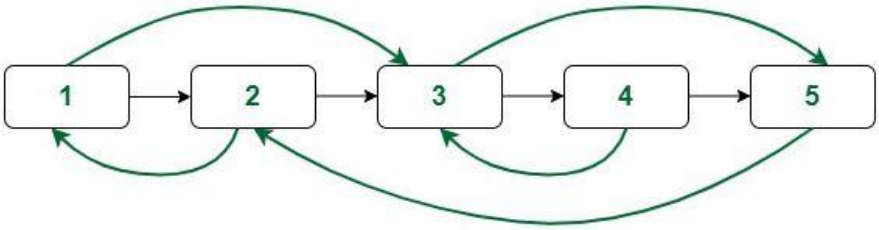
3. Given a singly linked list, write a function to swap elements pairwise.
   Input : 1->2->3->4->5->6->NULL
   Output : 2->1->4->3->6->5->NULL
   Input : 1->2->3->4->5->NULL
   Output : 2->1->4->3->5->NULL
   Input : 1->NULL
   Output : 1->NULL

4. Write a function that moves the last node to the front in a given Singly Linked List.
   Examples:
   Input: 1->2->3->4->5
   Output: 5->1->2->3->4
   Input: 3->8->1->5->7->12
   Output: 12->3->8->1->5->7

5. Given a linked list, check if the linked list has a loop or not.

6. An example of a linked list with a random pointerGiven a linked list of size N where each node has two links: one pointer points to the next node and the second pointer points to any node in the list. The task is to create a clone of this linked list in O(N) time.

An example of the linked list is shown in the below image:



7. Given a sorted doubly linked list of positive distinct elements, the task is to find pairs in a doubly-linked list whose sum is equal to given value x, without using any extra space? Example:

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Input : head : 1 <-> 2 <-> 4 <-> 5 <-> 6 <-> 8 <-> 9
        x = 7
Output: (6, 1), (5,2)
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8. Given a sorted doubly linked list and a value to insert, write a function to insert the value in a sorted way. Initial doubly linked list

9. Given a circular doubly linked list and a position n. The task is to delete the node at the given position n from the beginning. Initial circular doubly linked list.

10. Given a sorted circular doubly linked list of distinct nodes(no two nodes have the same data) and a value x. Count triplets in the list that sum up to a given value x.