PW SKILLS

Assignments

Linked List – 2

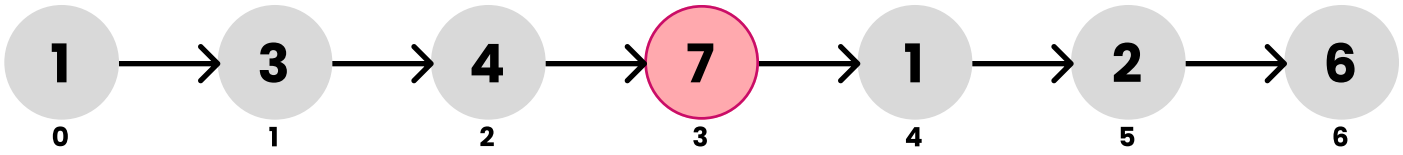
PW SKILLS

Q1. You are given the head of a linked list. Delete the middle node, and return the head of the modified linked list. [Leetcode 2095]

The middle node of a linked list of size n is the ⌊n / 2⌋th node from the start using 0- based indexing, where ⌊x⌋ denotes the largest integer less than or equal to x .

- For n = 1 , 2 , 3 , 4 , and 5 , the middle nodes are 0 , 1 , 1 , 2 , and 2 , respectively.

Example 1:



Input: head = [1,3,4,7,1,2,6]

Output: [1,3,4,1,2,6]

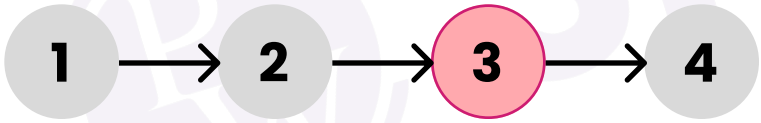
Explanation:

The above figure represents the given linked list. The indices of the nodes are written below.

Since n = 7, node 3 with value 7 is the middle node, which is marked in red.

We return the new list after removing this node.

Example 2:

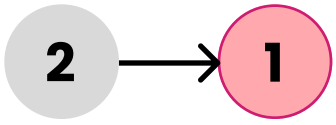


Input: head = [1,2,3,4]

Output: [1,2,4]

Explanation: The above figure represents the given linked list. For n = 4, node 2 with value 3 is the middle node, which is marked in red.

Example 3:



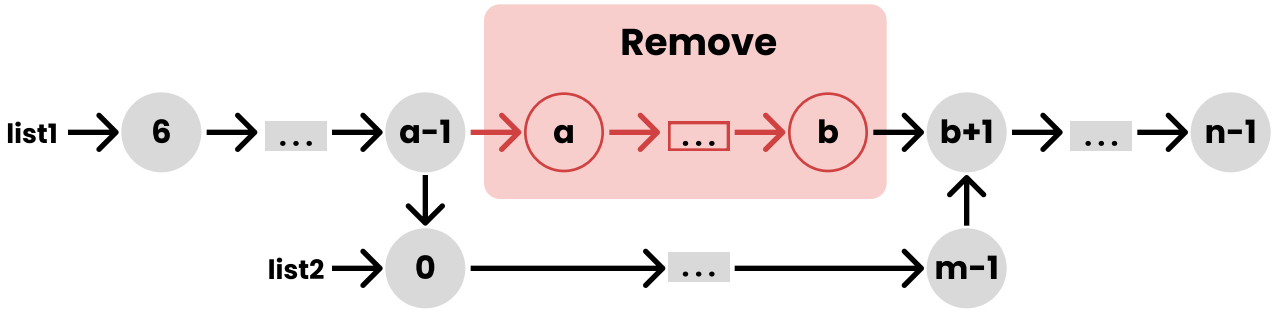
Input: head = [2,1]

Output: [2]

Explanation: The above figure represents the given linked list. For n = 2, node 1 with value 1 is the middle node, which is marked in red. Node 0 with value 2 is the only node remaining after removing node 1.

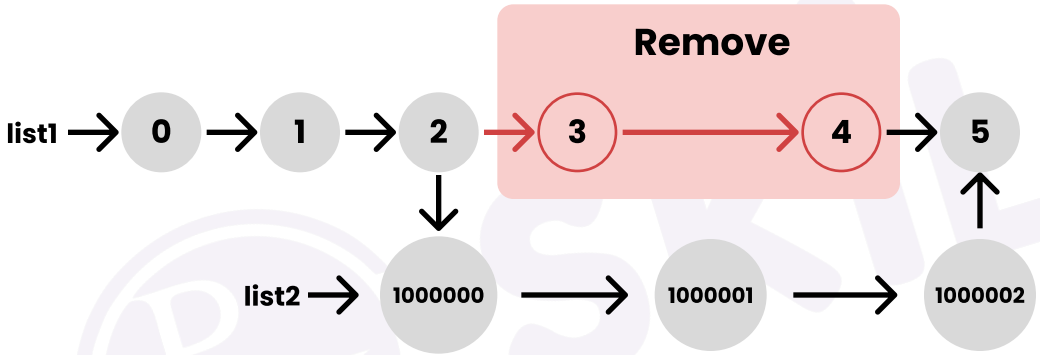
Q2. You are given two linked lists: list1 and list2 of sizes n and m respectively. Remove list1 's nodes from the ath node to the bth node, and put list2 in their place. [Leetcode 1669]

The blue edges and nodes in the following figure indicate the result:



Build the result list and return its head.

Example 1:

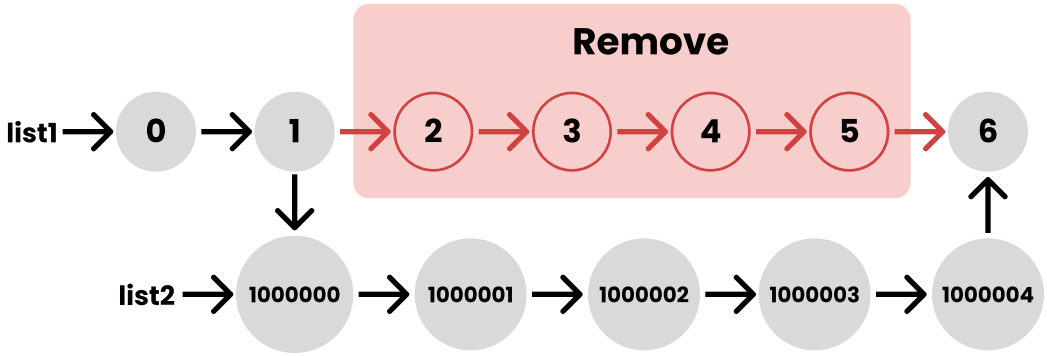


Input: list1 = [0,1,2,3,4,5], a = 3, b = 4, list2 = [1000000,1000001,1000002]

Output: [0,1,2,1000000,1000001,1000002,5]

Explanation: We remove the nodes 3 and 4 and put the entire list2 in their place. The blue edges and nodes in the above figure indicate the result.

Example 2:



Input: list1 = [0,1,2,3,4,5,6], a = 2, b = 5, list2 = [1000000,1000001,1000002,1000003,1000004]

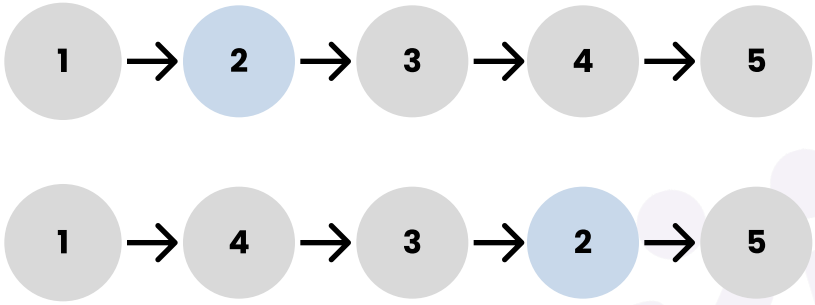
Output: [0,1,1000000,1000001,1000002,1000003,1000004,6]

Explanation: The blue edges and nodes in the above figure indicate the result.

Q3. You are given the head of a linked list, and an integer k .

Return the head of the linked list after swapping the values of the kth node from the beginning and the kth node from the end (the list is 1-indexed). [Leetcode 1721]

Example 1:



Input: head = [1,2,3,4,5], k = 2

Output: [1,4,3,2,5]

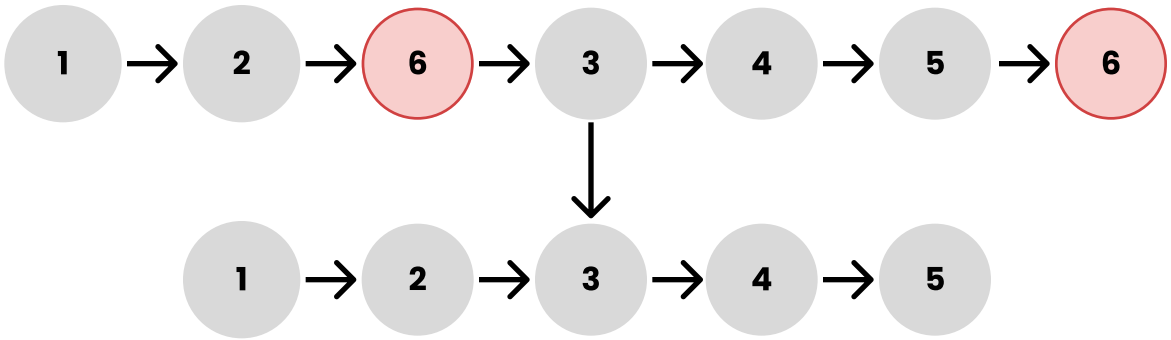
Example 2:

Input: head = [7,9,6,6,7,8,3,0,9,5], k = 5

Output: [7,9,6,6,8,7,3,0,9,5]

Q4. Given the head of a linked list and an integer val , remove all the nodes of the linked list that has Node.val == val , and return the new head.

Example 1:



Input: head = [1,2,6,3,4,5,6], val = 6

Output: [1,2,3,4,5]

Example 2:

Input: head = [], val = 1

Output: []

Example 3:

Input: head = [7,7,7,7], val = 7

Output: []

Q5. Find the length of loop in Cycle of Linked List.

Note:- Please try to invest time doing the assignments which are necessary to build a strong foundation. Do not directly Copy Paste using Google or ChatGPT. Please use your brain.