

## 1. Reverse a Singly Linked List

**Problem:** Write a function to reverse a singly linked list.

**Explanation:**

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

## 2. Detect a Loop in a Linked List

**Problem:** Write a function to detect if a singly linked list has a cycle (loop).

**Explanation:**

- Input: 1 -> 2 -> 3 -> 4 -> 2 (where the last node points back to the second node)
- Output: true

## 3. Remove Duplicates from a Sorted Linked List

**Problem:** Write a function to remove duplicates from a sorted singly linked list.

**Explanation:**

- Input: 1 -> 1 -> 2 -> 3 -> 3
- Output: 1 -> 2 -> 3

#### 4. Merge Two Sorted Linked Lists

**Problem:** Write a function to merge two sorted singly linked lists into one sorted list.

**Explanation:**

- Input: 1 -> 3 -> 5 and 2 -> 4 -> 6
- Output: 1 -> 2 -> 3 -> 4 -> 5 -> 6

#### 5. Find the Middle of a Linked List

**Problem:** Write a function to find the middle node of a singly linked list. If there are two middle nodes, return the second one.

**Explanation:**

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

#### 6. Remove the N-th Node from the End of a Linked List

**Problem:** Write a function to remove the N-th node from the end of a singly linked list.

**Explanation:**

- Input: 1 -> 2 -> 3 -> 4 -> 5, N = 2
- Output: 1 -> 2 -> 3 -> 5

## 7. Check if a Linked List is a Palindrome

**Problem:** Write a function to check if a singly linked list is a palindrome.

**Explanation:**

- Input: 1 -> 2 -> 3 -> 2 -> 1
- Output: true

## 8. Intersection of Two Linked Lists

**Problem:** Write a function to get the intersection point of two singly linked lists.

**Explanation:**

- Input: 1 -> 2 -> 3 -> 4 -> 5 and 6 -> 7 -> 4 -> 5
- Output: Node with value 4

## 9. Delete a Node in the Middle of a Linked List

**Problem:** Given only access to a node in the middle of a singly linked list, write a function to delete this node.

### **Explanation:**

- Input: Node with value 3 in 1 -> 2 -> 3 -> 4 -> 5
- Output: 1 -> 2 -> 4 -> 5

### **10. Partition a Linked List Around a Value**

**Problem:** Write a function to partition a singly linked list around a value  $x$ , such that all nodes less than  $x$  come before nodes greater than or equal to  $x$ .

### **Explanation:**

- Input: 3 -> 5 -> 8 -> 5 -> 10 -> 2 -> 1,  $x = 5$
- Output: 3 -> 2 -> 1 -> 5 -> 8 -> 5 -> 10

**CompilePanda**