

## Task 7

### Merging Two Sorted Linked Lists

You are provided with the heads of two sorted linked lists. The lists are sorted in ascending order. Create a merged linked list in ascending order from the two input lists without using any extra space (i.e., do not create any new nodes).

ANS:

```
package Assignmentday12.com;
class ListNode4 {
    int val;
    ListNode4 next;
    ListNode4(int val) {
        this.val = val;
        this.next = null;
    }
}

public class Task7 {
    public static ListNode4 mergeTwoLists(ListNode4 l1, ListNode4 l2) {
        // Create a dummy node to act as the start of the merged list
        ListNode4 dummy = new ListNode4(-1);
        ListNode4 current = dummy;
        // Merge the lists
        while (l1 != null && l2 != null) {
            if (l1.val <= l2.val) {
                current.next = l1;
                l1 = l1.next;
            } else {
                current.next = l2;
                l2 = l2.next;
            }
            current = current.next;
        }
        // Append the remaining nodes
        if (l1 != null) {
            current.next = l1;
        } else {
            current.next = l2;
        }
        // The head of the merged list is the next node of the dummy node
    }
}
```

```

        return dummy.next;
    }
    public static void printList(ListNode4 head) {
        ListNode4 current = head;
        while (current != null) {
            System.out.print(current.val + " ");
            current = current.next;
        }
        System.out.println();
    }
    public static void main(String[] args) {
        // Example: Create two sorted linked lists
        ListNode4 l1 = new ListNode4(1);
        l1.next = new ListNode4(3);
        l1.next.next = new ListNode4(5);
        ListNode4 l2 = new ListNode4(2);
        l2.next = new ListNode4(4);
        l2.next.next = new ListNode4(6);
        // Merge the lists
        ListNode4 mergedList = mergeTwoLists(l1, l2);
        // Print the merged list
        System.out.println("Merged List:");
        printList(mergedList);
    }
}

```

OUTPUT:

Merged List:

1 2 3 4 5 6