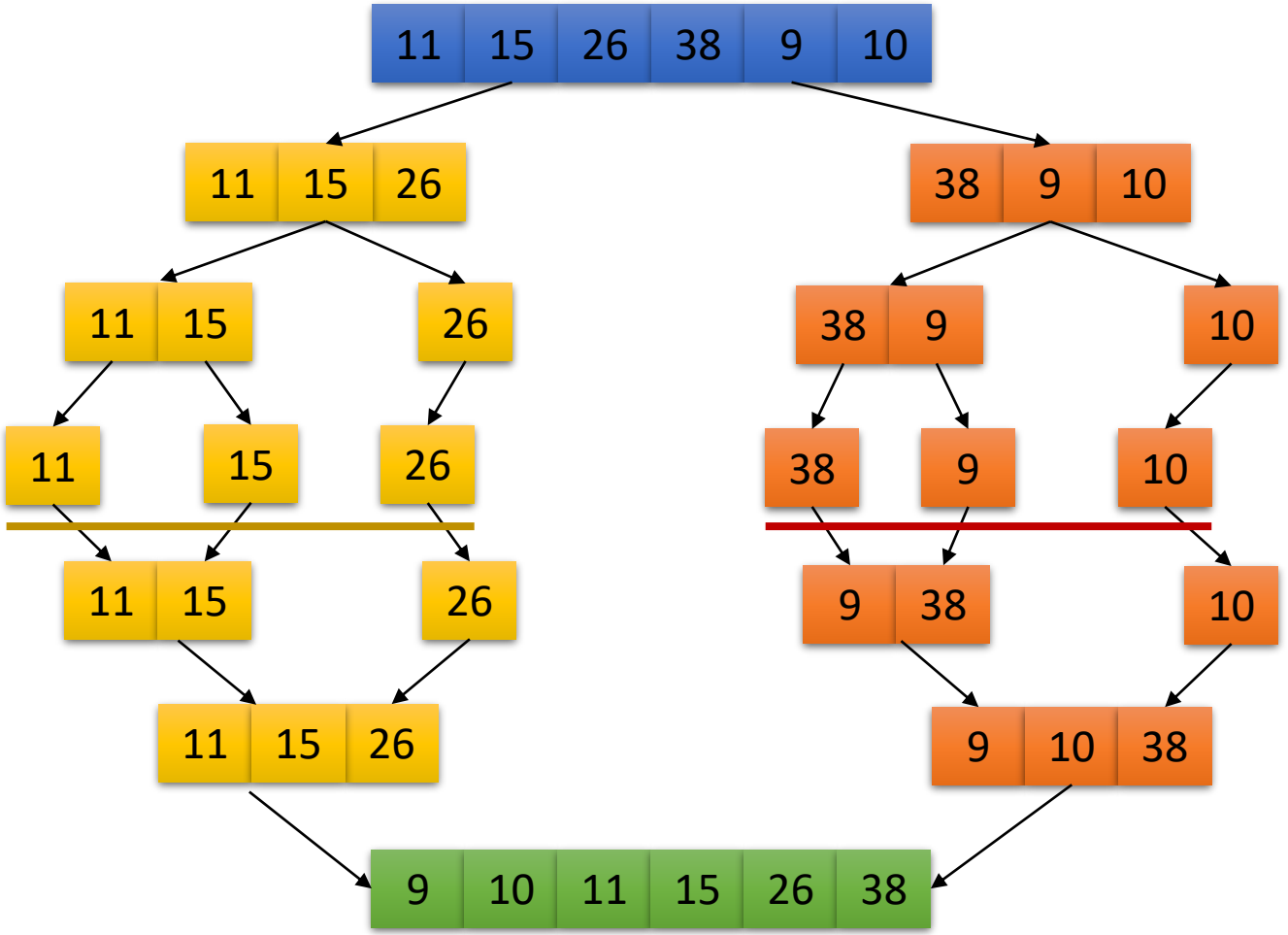

FACE
Prep

Merge Sort in DLL

Merge Sort



Merge Sort in Doubly Linked List

Problem:

Sort the given doubly linked list

```java
import java.util.Scanner;
class Node {
    int data;
    Node next, prev;
    Node(int val){
        data = val;
        next = null;
        prev = null;
    }
}
class Solution {
    public Node split(Node head) {
        Node fast = head, slow = head;
        while (fast.next != null && fast.next.next != null) {
            fast = fast.next.next;
            slow = slow.next;
        }
        Node temp = slow.next;
        slow.next = null;
        return temp;
    }

```

```
23      public Node mergeSort(Node node) {
24          if (node == null || node.next == null)
25              return node;
26          Node second = split(node);
27          node = mergeSort(node);
28          second = mergeSort(second);
29          return merge(node, second);
30      }
31      public Node merge(Node first, Node second) {
32          if (first == null)
33              return second;
34          if (second == null)
35              return first;
36          if (first.data < second.data) {
37              first.next = merge(first.next, second);
38              first.next.prev = first;
39              first.prev = null;
40              return first;
41          }
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```

```
45              else {
46                  second.next = merge(first, second.next);
47                  second.next.prev = second;
48                  second.prev = null;
49                  return second;
50              }
51          }
52  }
53  public class Main
54  {
55      public static void printList_left_right(Node head){
56          while(head != null){
57              System.out.print(head.data + " ");
58              head = head.next;
59          }
60          System.out.println();
61      }
62
63
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65
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```

```
67      public static void printList_right_left(Node head){
68              Node tail = head;
69              while(tail.next != null)
70                  tail = tail.next;
71              while(tail != null){
72                   System.out.print(tail.data + " ");
73                   tail = tail.prev;
74               }
75                System.out.println();
76          }
77      public static void main(String[] args) {
78               Scanner sc=new Scanner(System.in);
79               int n = sc.nextInt();
80               int val = sc.nextInt();
81               Node head = new Node(val);
82               for(int i=0;i<n;i++){
83                   val = sc.nextInt();
84                   Node nd = new Node(val);
85                   nd.next = head;
86                   head = nd;
87               }
88
```

```
89          Solution g = new Solution();
90          Node res = g.mergeSort(head);
91          printList_left_right(res);
92          printList_right_left(res);
93      }
94  }
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```

THANK YOU

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