

## Merge Two Sorted Lists

list1 = [1, 2, 4]



list2 = [1, 3, 4]



Compare to see which list's head will be used first.

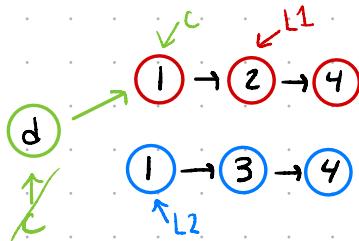
if  $\text{list1.val} < \text{list2.val}$  or  $\text{list1.val} == \text{list2.val}$ :

    pass

elif  $\text{list2.val} < \text{list1.val}$ :

    pass

Since 1 == 1, we'll start w/ if statement:



dummy = ListNode()  
current = dummy

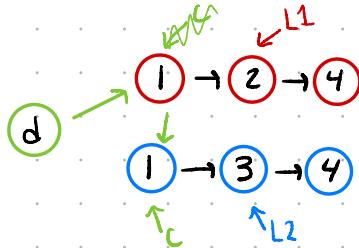
if  $\text{list1.val} < \text{list2.val}$  or  $\text{list1.val} == \text{list2.val}$ :

    Current.next = list1

    Current = list1

    list1 = list1.next

When we compare list1 & list2 again.... we add to the elif statement now



if  $\text{list1.val} < \text{list2.val}$  or  $\text{list1.val} == \text{list2.val}$ :

    Current.next = list1

    Current = list1

    list1 = list1.next

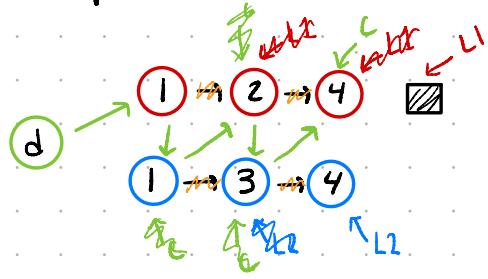
elif  $\text{list2.val} < \text{list1.val}$ :

    Current.next = list2

    current = list2

    list2 = list2.next

Keep Repeating Process --



\* Here list2 has nodes left while list1 is empty.

Now we know this process keeps going until list1 & list2 are None/Null.

while list1 and list2:

if list1.val < list2.val or list1.val == list2.val:

    current.next = list1

    current = list1

    list1 = list1.next

elif list2.val < list1.val:

    current.next = list2

    current = list2

    list2 = list2.next

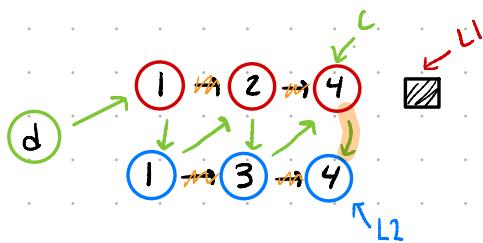
\* We have to attach remaining nodes of list1 or list2 to the merged list. Only one of the linked lists will have remaining nodes at this point, so we link cur.next to the non-empty list.

So we add this line of code ...

    current.next = list1 if list1 else list2

The if list1 else list2 part determines which list still has nodes left:

- if list1 is not empty, cur.next is set to list1
- if list1 is empty, cur.next is set to list2



We end up w/ a Linked List that looks like this:

(d) → (1) → (1) → (2) → (3) → (4) → (4)

We return dummy.next

## Final Code:

```
def mergeTwoLists (list1, list2):
    while list1 and list2:
        if list1.val < list2.val or list1.val == list2.val:
            Current.next = list1
            Current = list1
            list1 = list1.next
        elif list2.val < list1.val:
            Current.next = list2
            current = list2
            list2 = list2.next
        current.next = list1 if list1 else list2
    return dummy.next
```