

23. Merge k Sorted Lists

Hard

You are given an array of k linked-lists lists, each linked-list is sorted in ascending order.

Merge all the linked-lists into one sorted linked-list and return it.

```
'''
```

Definition for singly-linked list.

```
class ListNode:
```

```
    def __init__(self, val=0, next=None):
        self.val = val
        self.next = next
```

```
'''
```

```
class Solution:
```

```
    def mergeKLists(self, lists: List[Optional[ListNode]]) -> Optional[ListNode]:
        if not lists or len(lists) == 0:
            return None
        while len(lists) > 1:
            mergedList = []
            for i in range(0, len(lists), 2):
                l1 = lists[i]
                l2 = lists[i+1] if (i + 1) < len(lists) else None
                mergedList.append(self.mergeList(l1, l2))
            lists = mergedList
        return lists[0]
```

```
    def mergeList(self, l1, l2):
        dummy = ListNode()
        tail = dummy
        while l1 and l2:
            if l1.val < l2.val:
                tail.next = l1
                l1 = l1.next
            else:
                tail.next = l2
                l2 = l2.next
            tail = tail.next
        if l1:
            tail.next = l1
        if l2:
            tail.next = l2
        return dummy.next
```

same as LC_0021 merge two sorted lists

Example 1:

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

Output: [1,1,2,3,4,4,5,6]

Explanation: The linked-lists are:

```
[
```

```
    1->4->5,
```

```
    1->3->4,
```

```
    2->6
```

```
]
```

merging them into one sorted list:

1->1->2->3->4->4->5->6

Example 2:

Input: lists = []

Output: []

Example 3:

Input: lists = [[]]

Output: []

$lists = [linkedlist1, linkedlist2, linkedlist3 \dots]$

1. declare merged-list = []

2. use for loop, but increment range by 2.

3. merge the first and second lists, where:

$l1 = lists[i]$

$l2 = lists[i+1]$ if $(i+1) < len(lists)$ else None

merged-list.append(mergeList(l1+l2))

4. then make merged-list \rightarrow lists

lists = merged-list

5 return lists[0]