class Solution:

def reorderList(self, head: Optional[ListNode]) -> None:

fast = head

slow = head

# Step 1: Find the middle of the list

while fast and fast.next:

fast = fast.next.next

slow = slow.next

# Step 2: Reverse the second half of the list

second = slow.next

slow.next = None

node = None

while second:

temp = second.next

second.next = node

node = second

second = temp

# Step 3: Merge the two halves

first = head

second = node

while second:

temp1, temp2 = first.next, second.next

first.next, second.next = second, temp1

first, second = temp1, temp2