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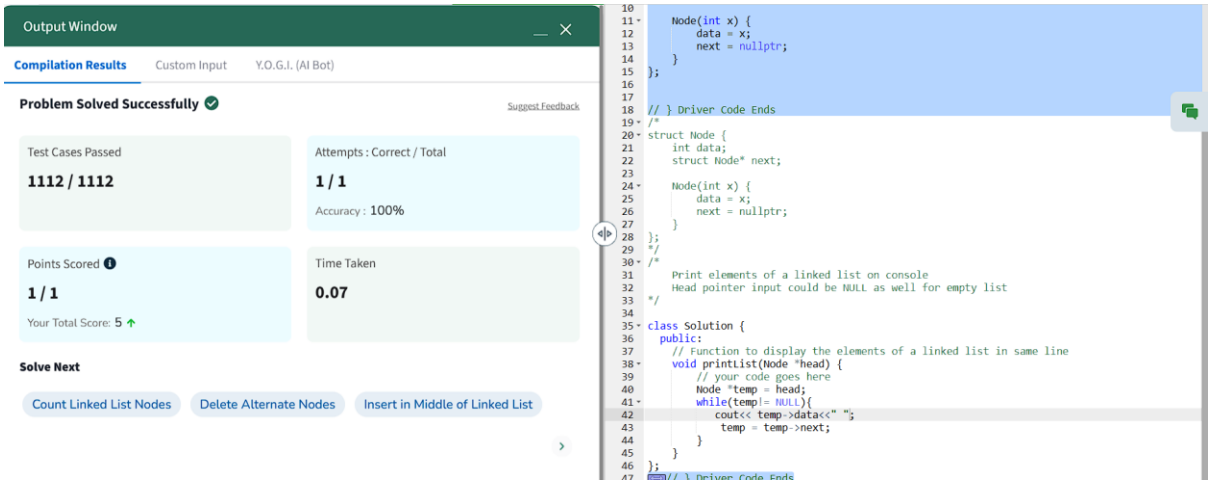
Aim: Given a linked list. Print all the elements of the linked list separated by space followed.

Code:

```
class Solution {
  public:
    // Function to display the elements of a linked list in same line
    void printList(Node *head) {
        // your code goes here
        Node* temp=head; // temp ptr pointing to head
        while(temp!=NULL){  //traverse till the last element
            cout<<temp->data<<" "; //print each element
            temp=temp->next; // increment temp ptr
        }
    }
};
```

Output:



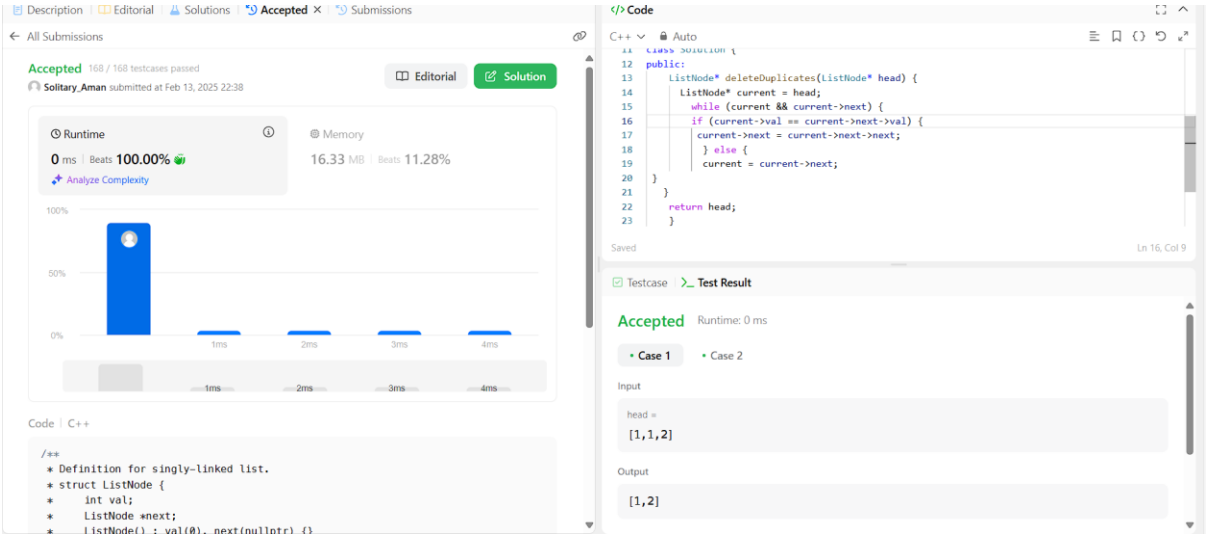
Aim: Remove Duplicates from Sorted List

Code:

```
public:
    ListNode* deleteDuplicates(ListNode* head) {
      ListNode* current = head;
        while (current && current->next) {
        if (current->val == current->next->val) {
         current->next = current->next->next;
          } else {
          current = current->next;
 }
   }
    return head;
```

```
    }
};
```

Output:



Aim: Reverse Linked List

Code:

```
class Solution {
    public:
 ListNode* reverseList(ListNode* head) {
 ListNode* prev = nullptr;
 ListNode* current = head;
 while (current) {
    ListNode* nextNode = current->next;
    current->next = prev;
    prev = current;
     current = nextNode;
 }
 return prev;
```

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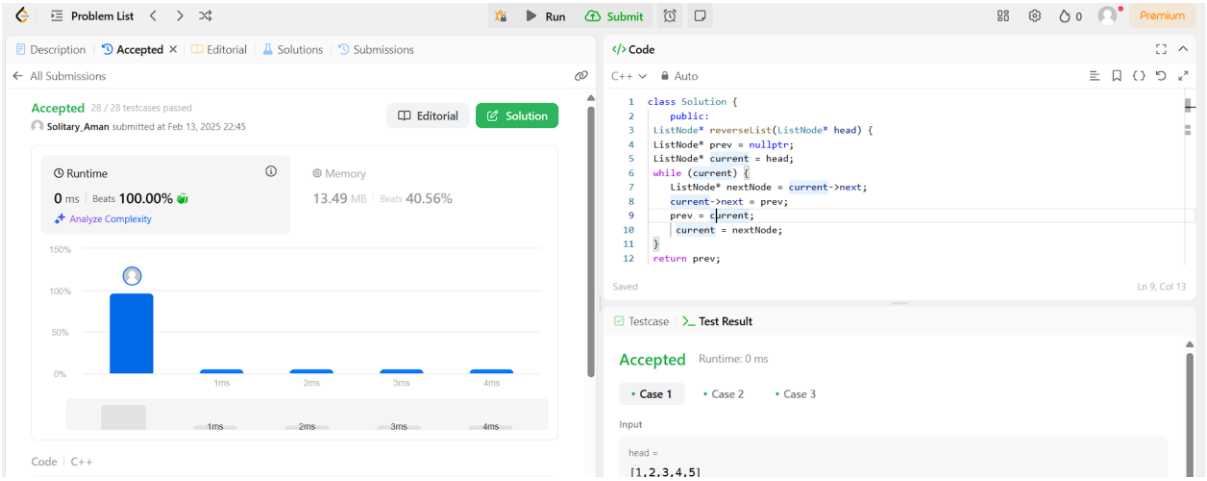
Output:



Aim: Delete the Middle Node of a Linked List

Code:

```
if(head==NULL || head->next==NULL){
    return NULL;
}
ListNode*slow=head;
ListNode*fast=head;
ListNode*prev=NULL;

while(fast!=NULL && fast->next!=NULL){
    prev=slow;
    slow=slow->next;
    fast=fast->next->next;
}
prev->next=slow->next;
delete slow;
return head;
```

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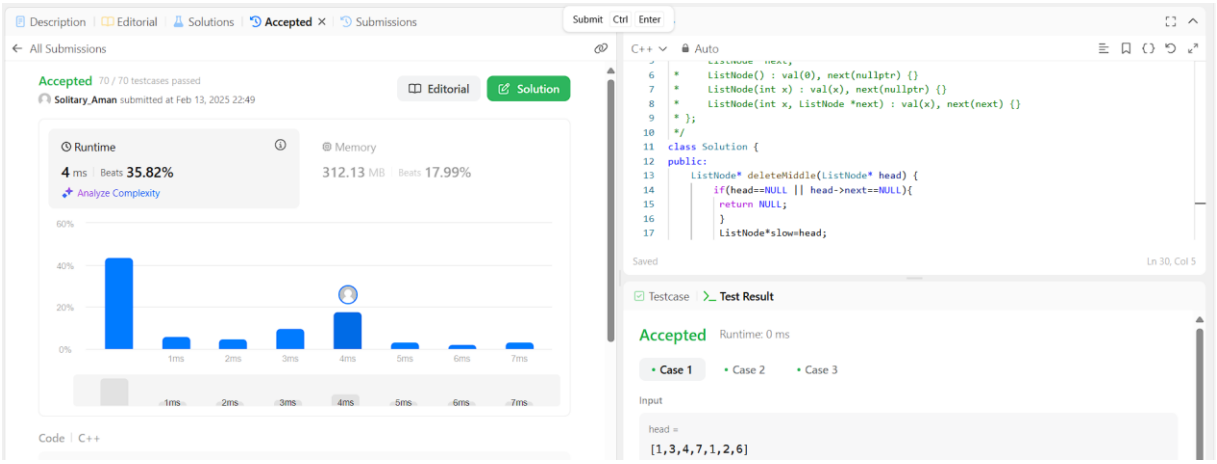
Output:



Aim: Merge Two Sorted Lists

Code:

```
ListNode* mergeTwoLists(ListNode* list1, ListNode* list2) {
    ListNode* dummy = new ListNode(0);
    ListNode* current = dummy;
   while (list1 != nullptr && list2 != nullptr) {
   if (list1->val < list2->val) {
   current->next = list1;
   list1 = list1->next;
   } else {
   current->next = list2;
   list2 = list2->next;
   }
    current = current->next;
   }
    current->next = list1 != nullptr ? list1 : list2;
   return dummy->next;
  }
```

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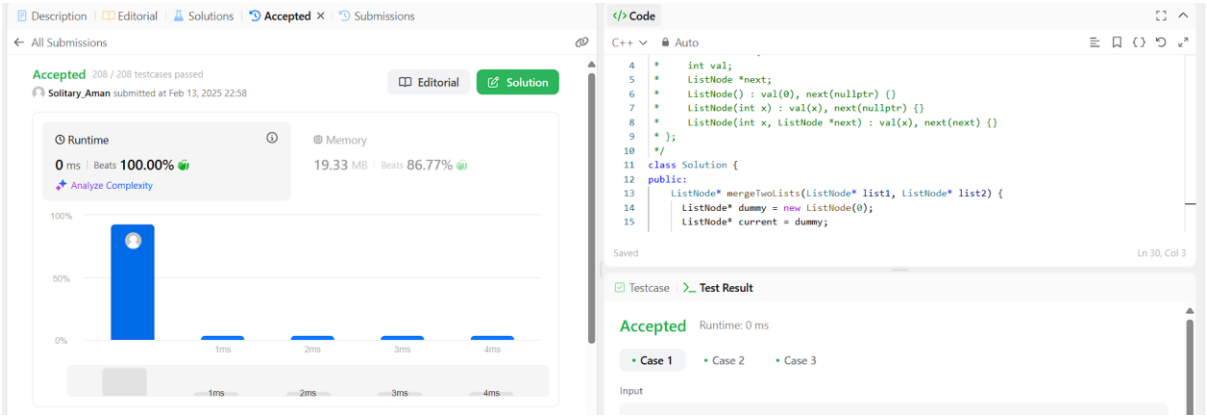
Output:

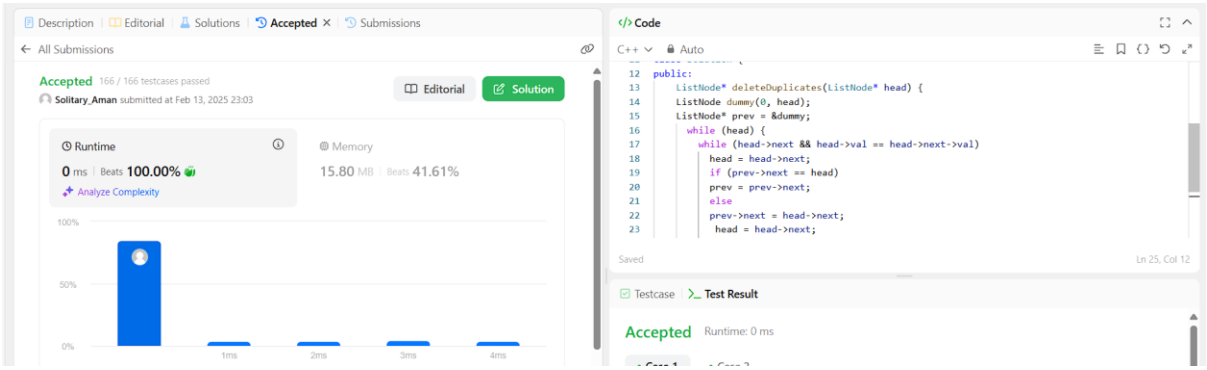


Aim: Remove Duplicates from Sorted List II

Code:

```
class Solution {
 public:
  ListNode* deleteDuplicates(ListNode* head) {
    ListNode dummy(0, head);
    ListNode* prev = &dummy;
    while (head) {
      while (head->next && head->val == head->next->val)
        head = head->next;
      if (prev->next == head)
        prev = prev->next;
      else
        prev->next = head->next;
      head = head->next;
    }
    return dummy.next;
  }
};
```

Output:

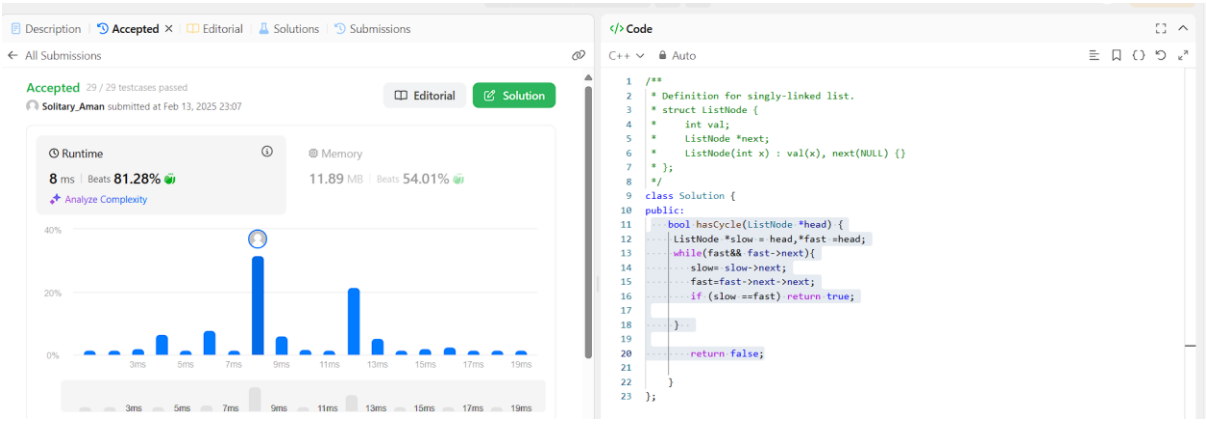


Aim: Linked List Cycle

Code:

```
bool hasCycle(ListNode *head) {
  ListNode *slow = head,*fast =head;
  while(fast&& fast->next){
    slow= slow->next;
    fast=fast->next->next;
    if (slow ==fast) return true;
  }
    return false;
```

Output:



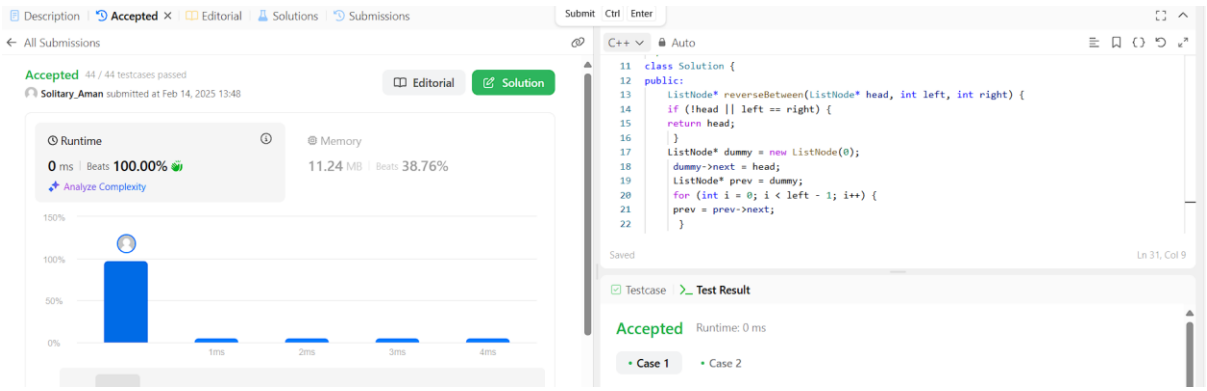
Aim : Reverse Linked List II

Code:

```
public:
  ListNode* reverseBetween(ListNode* head, int left, int right) {
    if (!head || left == right) {
      return head;
```

```
        }
        ListNode* dummy = new ListNode(0);
        dummy->next = head;
        ListNode* prev = dummy;
        for (int i = 0; i < left - 1; i++) {
            prev = prev->next;
        }
ListNode* cur = prev->next;
        for (int i = 0; i < right - left; i++) {
            ListNode* temp = cur->next;
            cur->next = temp->next;
            temp->next = prev->next;
            prev->next = temp;
        }
        return dummy->next;
    }
};
```

Output:



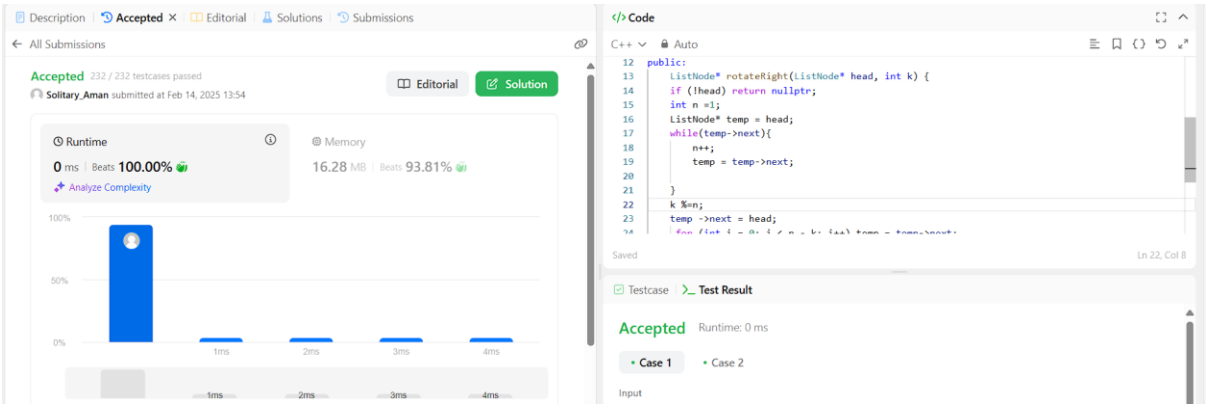
Aim : Rotate List

Code:

```
if (!head) return nullptr;
        int n = 1;
        ListNode* temp = head;
        while (temp->next) {
            n++;
            temp = temp->next;
        }
```

```
        k %= n;
        temp->next = head;
        for (int i = 0; i < n - k; i++) temp = temp->next;
        ListNode* new_head = temp->next;
        temp->next = nullptr;
        return new_head;
}
};
```

Output:

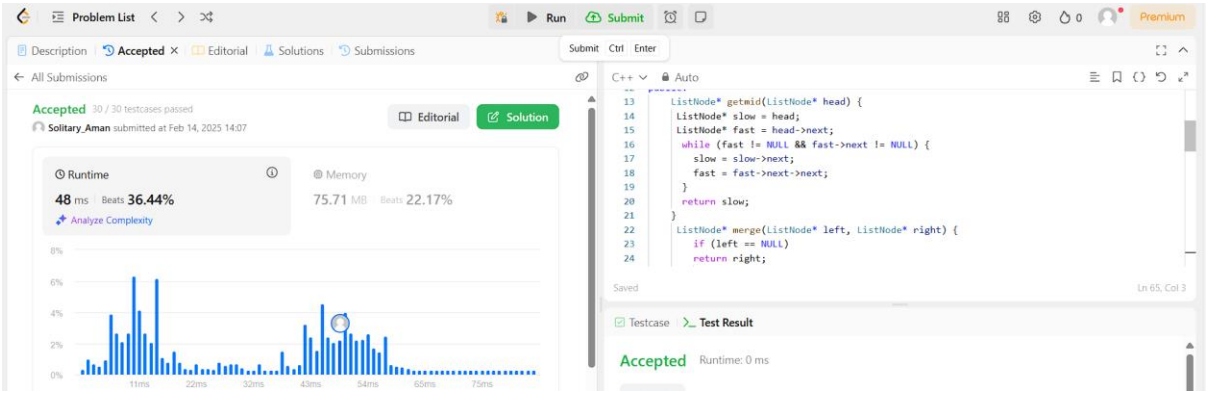


Aim : Sort List

Code:

```
public:
   ListNode* getmid(ListNode* head) {
    ListNode* slow = head;
    ListNode* fast = head->next;
     while (fast != NULL && fast->next != NULL) {
      slow = slow->next;
      fast = fast->next->next;
     }
    return slow;
…       right = sortList(right);
     ListNode* result = merge(left, right);
     return result;
    }
};
```

Output:



Aim : Linked List Cycle II

Code:

```
public:
    ListNode *detectCycle(ListNode *head) {
        ListNode* slow = head;
        ListNode* fast = head;
        while (fast && fast->next) {
            slow = slow->next;
            fast = fast->next->next;
            if (slow == fast) break;
        }
        if (!fast || !fast->next) return nullptr;
        fast = head;
        while (fast != slow) {
            fast = fast->next;
            slow = slow->next;
        }
        return slow;
    }
};
```

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Output: