AP Assignment 3

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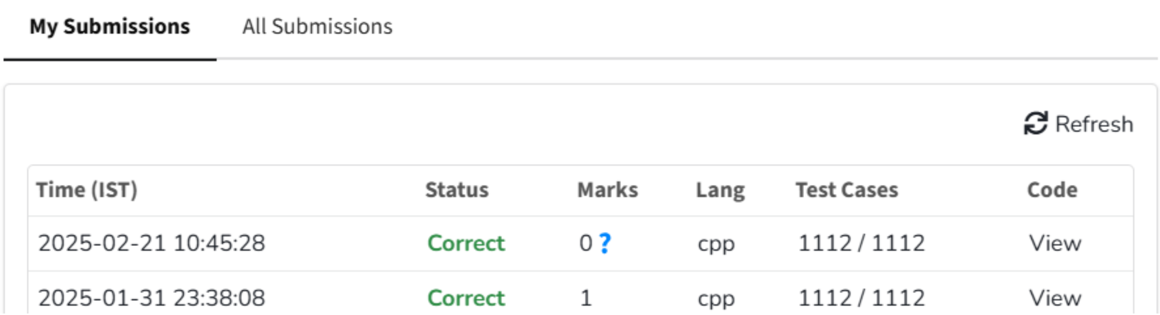
Section : 608-B

1) Print Linked List

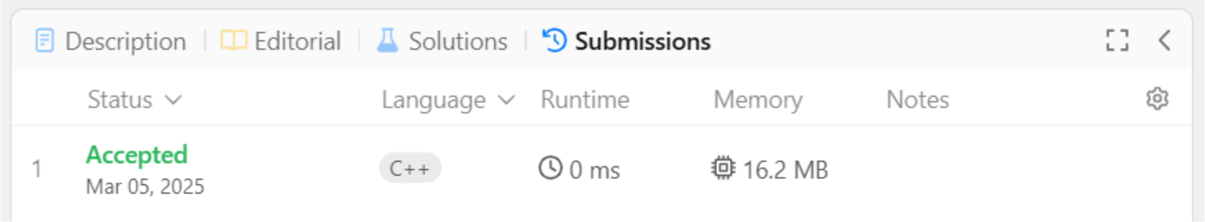
```
class Solution {
  public:
    void printList(Node *head) {
        Node*temp=head;
        while(temp!=NULL){
            cout<<temp->data<<" ";
            temp=temp->next;
        }
    }
};
```



Time (IST)	Status	Marks	Lang	Test Cases	Code
2025-02-21 10:45:28	Correct	0 ?	cpp	1112 / 1112	View
2025-01-31 23:38:08	Correct	1	cpp	1112 / 1112	View

2) Remove duplicates from a sorted list

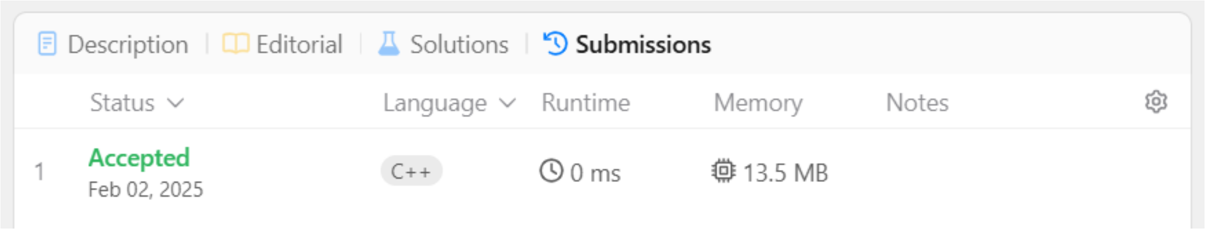
```
class Solution {
public:
    ListNode* deleteDuplicates(ListNode* head) {
        ListNode*temp=head;
        while(temp && temp->next){
            if(temp->val==temp->next->val){
                temp->next=temp->next->next;
            }
            else{
                temp=temp->next;
     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



	Status	Language	Runtime	Memory	Notes
1	Accepted Mar 05, 2025	C++	0 ms	16.2 MB	

3) Reverse a linked list

```
class Solution {
public:
    ListNode* reverseList(ListNode* head) {
        ListNode*prev=NULL;
        ListNode*curr=head;
        while(curr!=NULL){
            ListNode*next=curr->next;
            curr->next=prev;
            prev=curr;
            curr=next;
        }
        return prev;
    }
};
```

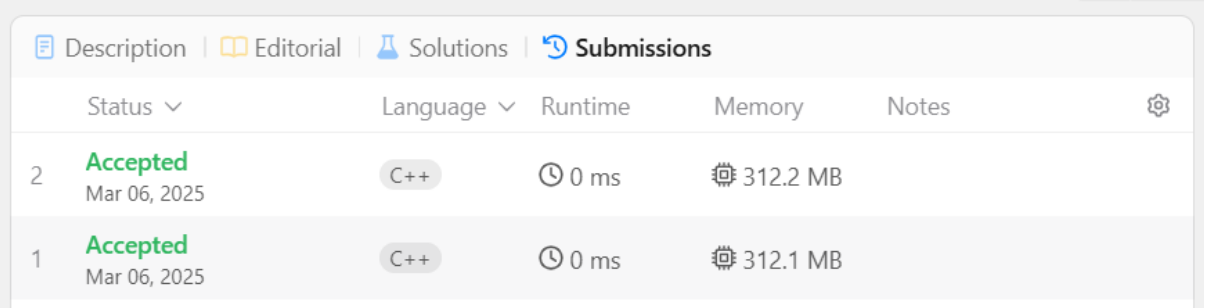


Description | Editorial | Solutions | Submissions

	Status	Language	Runtime	Memory	Notes
1	Accepted Feb 02, 2025	C++	0 ms	13.5 MB	

4) Delete middle node of a list

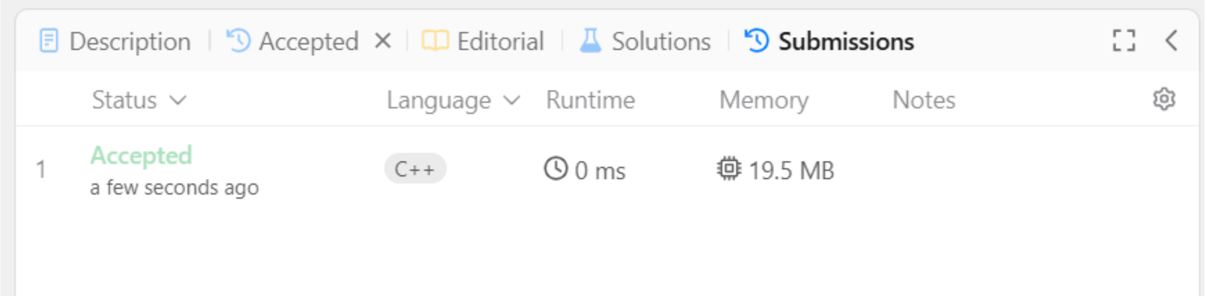
```
class Solution {
public:
    ListNode* deleteMiddle(ListNode* head) {
        if(!head->next){
            return NULL;
        }
        if(!head->next->next){
            head->next = NULL;
            return head;
        }
        ListNode* slow = head;
        ListNode* fast = head;
        ListNode* prev = NULL;
        while(fast && fast->next){
            prev=slow;
            slow = slow->next;
            fast = fast->next->next;
        }
        prev->next=slow->next;
        delete slow;
        return head;
    }
};
```



	Status	Language	Runtime	Memory	Notes
2	Accepted Mar 06, 2025	C++	0 ms	312.2 MB	
1	Accepted Mar 06, 2025	C++	0 ms	312.1 MB	

5) Merge two sorted linked lists

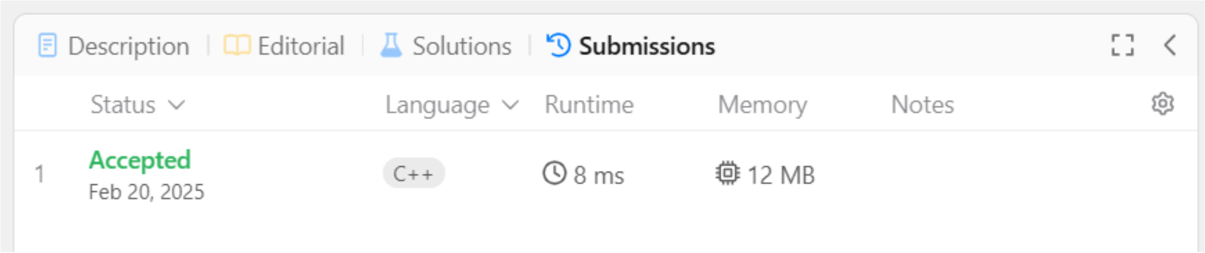
```
class Solution {
public:
    ListNode* mergeTwoLists(ListNode* list1, ListNode* list2) {
        ListNode dummy(0);
        ListNode* tail = &dummy;
        while (list1 && list2) {
            if (list1->val <= list2->val) {
                tail->next = list1;
                list1 = list1->next;
            } else {
                tail->next = list2;
                list2 = list2->next;
            }
            tail = tail->next;
        }
        tail->next = list1 ? list1 : list2;
        return dummy.next;
    }
};
```



	Status	Language	Runtime	Memory	Notes
1	Accepted a few seconds ago	C++	0 ms	19.5 MB	

6) Detect a cycle in a linked list

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

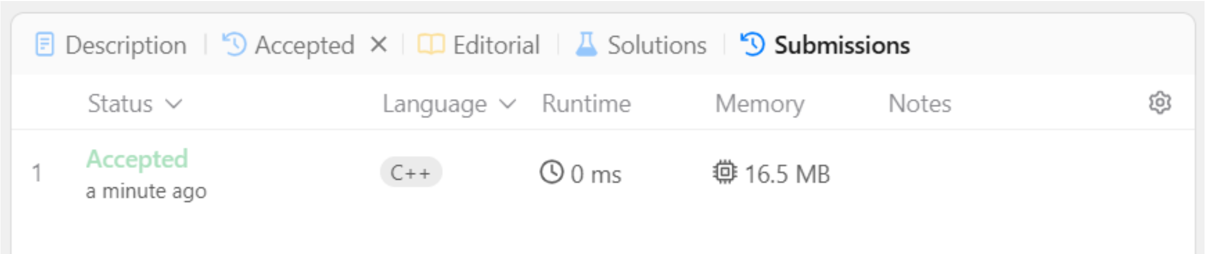


	Status	Language	Runtime	Memory	Notes
1	Accepted Feb 20, 2025	C++	8 ms	12 MB	

7) Rotate a list

```
class Solution {
```

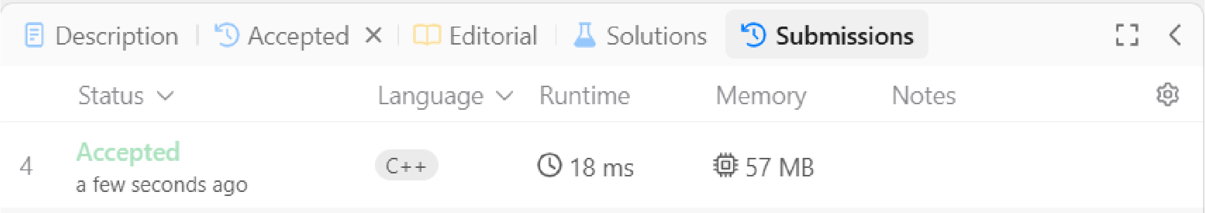
```
public:
    ListNode* rotateRight(ListNode* head, int k) {
        if (!head || !head->next || k == 0) return head;
        int length = 1;
        ListNode* tail = head;
        while (tail->next) {
            tail = tail->next;
            length++;
        }
        k = k % length;
        if (k == 0) return head;
        ListNode* newTail = head;
        for (int i = 0; i < length - k - 1; i++) {
            newTail = newTail->next;
        }
        ListNode* newHead = newTail->next;
        newTail->next = nullptr;
        tail->next = head;

        return newHead;
    }
};
```



	Status	Language	Runtime	Memory	Notes
1	Accepted a minute ago	C++	0 ms	16.5 MB	

8) Sort list

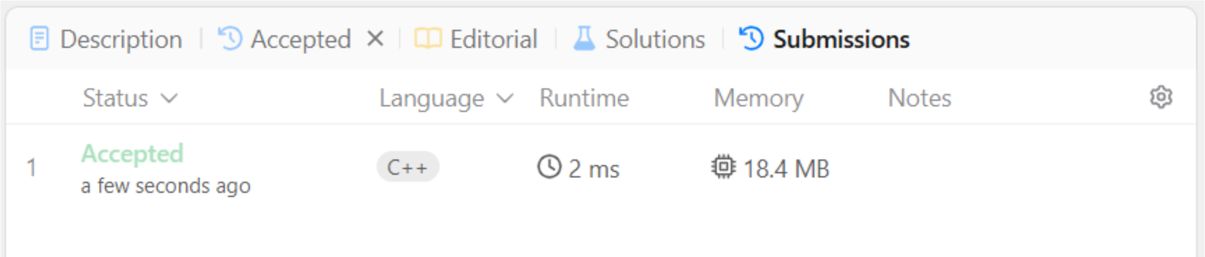
```
class Solution {
public:
    ListNode* findMiddle(ListNode* head) {
        ListNode* slow = head;
        ListNode* fast = head->next;

        while (fast && fast->next) {
            slow = slow->next;
            fast = fast->next->next;
        }
        return slow;
    }
    ListNode* merge(ListNode* left, ListNode* right) {
        ListNode dummy(0);
        ListNode* tail = &dummy;
        while (left && right) {
            if (left->val <= right->val) {
                tail->next = left;
                left = left->next;
            } else {
                tail->next = right;
                right = right->next;
            }
            tail = tail->next;
        }
        tail->next = left ? left : right;
        return dummy.next;
    }
    ListNode* sortList(ListNode* head) {
        if (!head || !head->next) return head

        ListNode* mid = findMiddle(head);
        ListNode* rightHalf = mid->next;
        mid->next = nullptr;
        ListNode* leftSorted = sortList(head);
        ListNode* rightSorted = sortList(rightHalf);
        return merge(leftSorted, rightSorted);
    }
};
```



	Status	Language	Runtime	Memory	Notes
4	Accepted a few seconds ago	C++	18 ms	57 MB	

9) Merge k sorted lists

```
#include <queue>
class Solution {
public:
    struct Compare {
        bool operator()(ListNode* a, ListNode* b) {
            return a->val > b->val;
        }
    };
    ListNode* mergeKLists(vector<ListNode*>& lists) {
        priority_queue<ListNode*, vector<ListNode*>, Compare> minHeap;
        for (ListNode* list : lists) {
            if (list) minHeap.push(list);
        }
        ListNode dummy(0);
        ListNode* tail = &dummy;
        while (!minHeap.empty()) {
            ListNode* smallest = minHeap.top();
            minHeap.pop();
            tail->next = smallest;
            tail = tail->next;
            if (smallest->next) {
                minHeap.push(smallest->next);
            }
        }
        return dummy.next;
    }
};
```



	Status	Language	Runtime	Memory	Notes
1	Accepted a few seconds ago	C++	2 ms	18.4 MB	