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# Worksheet 4

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| **UID:20BCS1409** | **Date- 04/01/2023** |

**Que-1: Remove Duplicates from Sorted List**

**Code:**

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

**Output:**


**Que-2: [Palindrome Linked List]**

**Code:**

```
class Solution {
public:
    ListNode* calmid(ListNode* head){
        ListNode* slow=head;
ListNode* fast=head;
        while(fast!=nullptr && fast->next!=nullptr){
            slow=slow->next;
fast=fast->next->next;
        }
        return slow;
    }
```

```
    ListNode* reverse(ListNode* head){
        ListNode* curr=head;
        ListNode *temp=nullptr;
ListNode* prev=nullptr;
while(curr!=nullptr){
temp=curr->next;
curr->next=prev;
prev=curr;
curr=temp;
        }
        return prev;
    }
    bool isPalindrome(ListNode* head) {
        ListNode* p1=head;
        ListNode* mid=calmid(head);
ListNode* p2=reverse(mid);
while(p1!=nullptr && p2!=nullptr){
if(p1->val!=p2->val)
return false;              p1=p1->next;
p2=p2->next;
        }
        return true;
```

```
    }
};
```

**Output:**

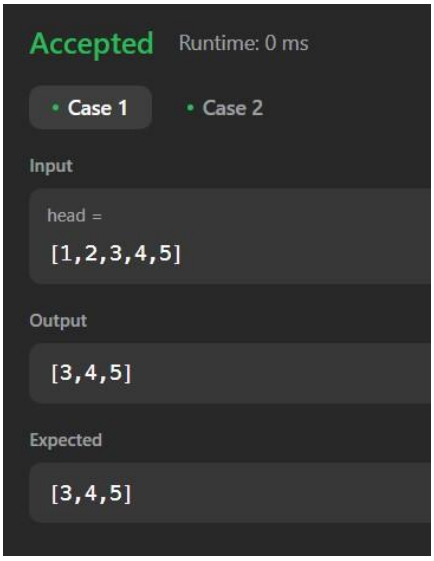

**Que-3: [Middle of the Linked List]**

**Code:**

```
class Solution {
public:
    ListNode* middleNode(ListNode* head) {
ListNode* fast=head,*slow=head;
        while(fast!=nullptr && fast->next!=nullptr){
            slow=slow->next;
fast=fast->next->next;
        }
```

```
        return slow;
    }
};
```

**Output:**




**Que-4: Add Two Numbers**

**Code:**

```
class Solution {
public:
    ListNode* addTwoNumbers(ListNode* l1, ListNode* l2) {
        ListNode* ans=nullptr;
ListNode* temp=nullptr;         int
carr=0,val;
        while(l1!=nullptr || l2!=nullptr){
```

```
            if(l1!=nullptr && l2!=nullptr){
val = l1->val + l2->val + carr;
l1 = l1->next;                  l2 = l2->next;
            }
            else if(l1 != nullptr) {
val = l1->val + carr;                   l1
= l1->next;
            }
            else if(l2 != nullptr) {
val = l2->val + carr;                   l2
= l2->next;
            }
else {
break;
            }
            carr=val/10;

            if(ans==nullptr){
                temp=new ListNode(val%10);
ans=temp;
            }
else{
                temp->next=new ListNode(val%10);
```

```
                temp = temp->next;
            }
}
        if(carr!=0){
            temp->next=new ListNode(carr);
        }
return ans;
    }
};
```

**Output:**


**Que-5: [Merge Two Sorted Lists]**

**Code:**

```
class Solution {
public:
    ListNode* mergeTwoLists(ListNode* list1, ListNode*
list2) {
```

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```
        if(list1==nullptr){
return list2;
        }
        if(list2==nullptr){
return list1;
        }
        ListNode *temp=NULL,*head =
NULL;          if(list1->val<list2->val){
temp = list1;              head=temp;
list1 = list1->next;
        }
else{
            temp = list2;
head=temp;             list2 =
list2->next;
        }
        while(list1!=nullptr && list2!=nullptr){
if(list1->val<list2->val){                temp-
>next=list1;                list1=list1->next;
temp=temp->next;
            }
```

```
            else{
                temp->next=list2;
list2=list2->next;                  temp=temp->next;
            }
}
        if(list1!=NULL)
        {
            temp->next = list1;
        }
        if(list2!=NULL)
        {
            temp->next = list2;
        }
        return head;
    }
};
```

**Output:**


Accepted
Runtime: 2 ms
Case 1
Case 2
Case 3
Input
list1 =
[1,2,4]
list2 =
[1,3,4]
Output
[1,1,2,3,4,4]
Expected
[1,1,2,3,4,4]