Add Two Linked List

Algorithm:

Step1:Firstly we traverse both the list

Step 2: then traverse both the list until any of them non empty or carry is zero

Step 3: add digit one by one ,firstly initialize carry=0,sum=0;

Step 4: after adding them ,find carry =sum/10 & sum=sum%10,

Step 5: then store value of sum in duplicate list

Step 6:then remove the duplicate list

Step 7:task done.

Add Two Linked List

Example 1: List1-> 4->5 List2-> 3->4->5

o/p=3=>9->0

Step By Step Solution:

Step-1: Remove both the list

list1->5->4

list2->5->4->3

Step 2: traverse both the list until both are empty or carry is 0

Step 3. Add digits one by one .initially we initialize sum=0 & carry =0.

carry 1

list1->5->4

list2->5->4->3

sum =0

sum=5+5+carry(0)=10;

Carry =sum/10=1;

Sum=sum%10=0;

Stroe sum in duplicate list: temp->0

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Step 4. Add digits one by one . sum=0 & carry =1.

carry 1 0
list1->5->4
list2->5->4->3
sum =0 9
sum=4+4+carry(1)=9;
Carry =9/10=0;
Sum=9%10=9;
Stroe sum in duplicate list: temp->0->9

Step 5. Add digits one by one . sum=0 & carry =0.

carry 1 0 0
list1->5->4
list2->5->4->3
sum =0 9 3
sum=3+carry(0)=3;
Carry =3/10=0;
Sum=3%10=3;
Stroe sum in duplicate list: temp->0->9->3

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Step 5. Add digits one by one . sum=0 & carry =0.

carry 1 0 0
list1->5->4
list2->5->4->3
sum =0 9 3
sum=3+carry(0)=3;
Carry =3/10=0;
Sum=3%10=3;
Stroe sum in duplicate list: temp->0->9->3

Step -6: reverse the duplicate list i.e. temp
now we get ->
temp->3->9->0

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Implementation:-

```
struct Node* addTwoLists(struct Node* first, struct Node* second)
 {
       first=reverseD(first,1); second=reverseD(second,1);  //Reverse both the list
       struct Node *dummy=new Node(0); struct Node*temp=dummy; int carry=0;
       while(first||second||carry)
       {       int sum=0;
               if(first) { sum+=first->data; first=first->next; }
              if(second) {  sum+=second->data;  second=second->next;}
               sum+=carry;
              carry=sum/10;
               struct Node *node=new Node(sum%10);
               temp->next=node;
              temp=temp->next;
        }
      dummy=reverseD(dummy,0);   //reverse duplicate
       return dummy;
 }
```

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Implementation:-

```
struct Node* reverseD(struct Node *cur,int c)
 {
     struct Node *cur1=cur,*prev=NULL,*next=NULL;
     while(cur1)
     {
         if(cur1->data==0&&c==0)
             {  cur1=cur1->next;c=1;}
        else
             { next=cur1->next; cur1->next=prev;
                  prev=cur1;  cur1=next;
              }
       }
   return prev;
  }
```