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BT22CSH015

```
// Create a doubly linked list in which info part of each node
stores 4 digits
// of a given number. The digits should be stored in reverse
order so that the
// LSB bits are stored in the first node and MSB bits in the
last node. If the
// number is 681325468132 then the linked list should be 2318
-> 6452 -> 3168.
// Write a function to add two numbers represented in this way.
Justify the time
// and space complexity.
```

```
#define ll long long int
#include<bits/stdc++.h>
using namespace std;
struct node
{
   ll data;
   node *next;
   node *prev;
}*num1=new node,*num2=new node;
```

```
void create(string s,node *first)
{
   ll i=0;
   for(ll i=0;i<s.length()/2;i++)
   {
      swap(s[i],s[s.length()-1-i]);
   }
   cout<<s<<endl;
```

```
   int loop=s.length()/4;
   int st=0;
   int en=4;
   string numStr = s.substr(0,4);
   int num = stoi(numStr);
```

```
   node *t=first;
   node *back=first;
   t->data=num;
   t->next=NULL;
   t->prev=NULL;
   loop=s.length()/4-1;
   st=0;en=4;
   while(loop--)
   {
      st+=4;
      en-=4;
      numStr = s.substr(st,4);
      int num = stoi(numStr);
      t=new node;
      t->data=num;
      t->next=NULL;
      t->prev=back;
      back->next=t;
      back=t;
   }
}
void display(node *first)
{
 node* p=first;
  while(p)
  {
   cout<<p->data<<" ";
   p=p->next;
  }
  cout<<endl;
}
node* add(node* num1, node* num2) {
    node* result = nullptr;
    node* p1 = num1;
    node* p2 = num2;
    int carry = 0;
    node* tail = nullptr;
```

```
    while (p1 || p2 || carry) {
        int sum = carry;
        if (p1) {
            sum += p1->data;
            p1 = p1->next;
```

```
        }
        if (p2) {
            sum += p2->data;
            p2 = p2->next;
        }
```

```
        carry = sum / 10000;
        sum = sum % 10000;
```

```
        node* newNode = new node;
        newNode->data = sum;
        newNode->next = nullptr;
        newNode->prev = tail;
```

```
        if (tail) {
            tail->next = newNode;
        } else {
            result = newNode;
        }
```

```
        tail = newNode;
    }
```

```
    return result;
}
```

```
int main()
{
     string s="122123422233";
     string s2="222113421123";
     create(s,num1);
     create(s2,num2);
     display(num1);
     display(num2);
     node *asfs=add(num1,num2);
     display(asfs);
     return 0;
}
```


91 newNode->prev = tail;
PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL PORTS
PS D:\Secondyear\cf> cd "d:\Secondyear\cf\" ; if ($?) { g++ dsaassignment4.cpp -o dsaassignment4 } ; if ($?) { .\dsaassignment4 }
332224321221
321124311222
3322 2432 1221
3211 2431 1222
6533 4863 2443
PS D:\Secondyear\cf>