DS LAB-APPLICATIONS OF LINKED LIST-1

Program and output

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Addition of 2 long positive integers-

```c
#include<stdio.h>

#include<conio.h>

#include<stdlib.h>

#include<string.h>

struct NODE

{

int info;

struct NODE*link;

};

typedef struct NODE*node;

node getnode()

{

node x;

x=(node)malloc(sizeof(struct NODE));

if(x==NULL)

{

printf("out of mamory\n");
```

```c
exit(0);

}

return x;

}

node ins_front(node first,int item)

{

node temp;

temp=getnode();

temp->info=item;

temp->link=first;

return temp;

}

node extract(char *s,node head)

{
        int i,n;

        for(i=0;i<strlen(s);i++)

        {

        n=s[i]-'0';

        head=ins_front(head,n);

        }

        return head;

}


node addlong(node head1,node head2,node head3)
```

```
{
        int temp,sum,carry=0;

        node cur1,cur2;

        cur1=head1;

        cur2=head2;

        while(cur1!=NULL&&cur2!=NULL)

        {
                temp=cur1->info+cur2->info+carry;

                if(temp>9)

                {
                sum=temp%10;

                carry=temp/10;

                }
                else

                {
                sum=temp;

                carry=0;

                }
                head3=ins_front(head3,sum);

                cur1=cur1->link;

                cur2=cur2->link;

        }
        while(cur1!=NULL)

        {
```

```c
temp=cur1->info+carry;

if(temp>9)

{

sum=temp%10;

carry=temp/10;

}

else

{

sum=temp;

carry=0;

}

head3=ins_front(head3,sum);

cur1=cur1->link;

}
while(cur2!=NULL)

{

temp=cur2->info+carry;

if(temp>9)

{

sum=temp%10;

carry=temp/10;

}

else

{
```

```c
                sum=temp;

                carry=0;

                }

        head3=ins_front(head3,sum);

        cur2=cur2->link;

        }


        if(cur1==NULL&&cur2==NULL)

        {

                if(carry==1)

                head3=ins_front(head3,carry);

        }

        return head3;

 }



void display(node first)

{

node cur;

if(first==NULL)

{

printf("Empty\n");

return;

}
```

```c
cur=first;

while(cur!=NULL)

{

printf("%d\t",cur->info);

cur=cur->link;

}

}

int main()

{

        int ch;

        node head1=NULL;

        node head2=NULL;

        node head3=NULL;

        char s1[30],s2[30];

        printf("\nEnter first integer\n");

        scanf("%s",s1);

        head1=extract(s1,head1);

        display(head1);

        printf("\nEnter second integer\n");

        scanf("%s",s2);

        head2=extract(s2,head2);

        display(head2);

        head3=addlong(head1,head2,head3);

        printf("\nThe result is\n");
```

```
        display(head3);

return 0;

}
```

Output-

```
Enter first integer
5896324
4       2       3       6       9       8       5
Enter second integer
4532145933285
5       8       2       3       3       9       5       4       1       2
The result is
4       5       3       2       1       5       1       8       2       9

...Program finished with exit code 0
Press ENTER to exit console.
```

```
Enter first integer
1234
4       3       2       1
Enter second integer
5678
8       7       6       5
The result is
6       9       1       2

...Program finished with exit code 0
Press ENTER to exit console.
```