16/12/2020

DS-LAB- APPLICATIONS OF LINKED LIST-1

Addition of 2 long positive integers :-

```
#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 memory \n");
    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 adding (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)
{
  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
  {
```

```
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;
}
 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("\n Enter first integer \n");
 scanf("%s", s1);
 head1 = extract(s1, head1);
 display(head1);
 printf("\n Enter second integer \n");
 scanf("%s", s2);
 head2 = extract(s2, head2);
 display(head2);
 head3 = adding(head1, head2, head3);
 printf("\n The result is \n");
 display(head3);
 return 0;
}
```