

## Q. Addition of two long Integers

```
#include <stdio.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 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;

```



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```
{
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)
    {

```

```

        temp = cur->info + carry;
        if (printf("%d\t", cur->info))
            cur = cur->link;
    }

```

```

}
void main()
{

```

```

    int ch;
    node head1 = NULL;
    node head2 = NULL;
    node head3 = NULL;
    char s1[30], s2[30];
    printf("\n Enter first integer\n");

```



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```
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 = addlong (head1, head2, head3);  
printf ("\n The result is \n");  
display (head3);  
}
```