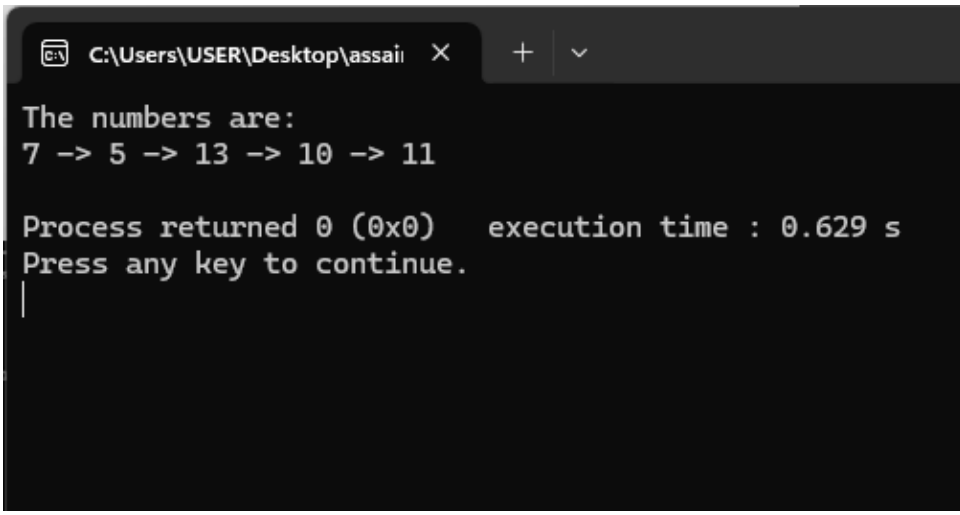
Practice Problems 4 Topic: Linked Lists ID:2023000000033

1. Write a code to create a linked list containing five nodes and display the values.

Nodes are: p = 7 q = 5 r = 13 s = 10 t = 11

Solution 1:

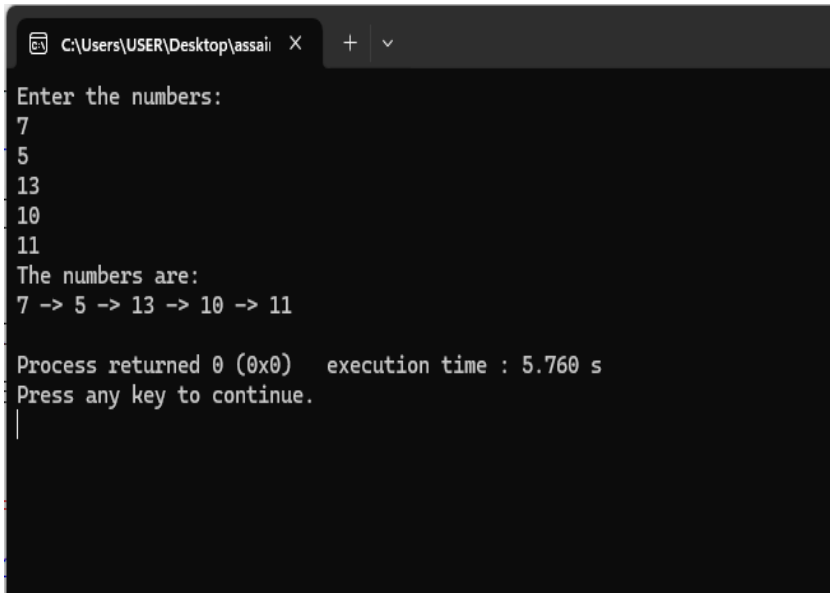
```
#include<stdio.h>
#include<stdlib.h>
struct node{
int data;
struct node* next;
        };
int main()   {
struct node* head =NULL;
struct node* p =NULL;
struct node* q =NULL;
struct node* r =NULL;
struct node* s =NULL;
struct node* t =NULL;
p=malloc(sizeof(struct node));
q=malloc(sizeof(struct node));
r=malloc(sizeof(struct node));
s=malloc(sizeof(struct node));
t=malloc(sizeof(struct node));
p->data=7;
q->data=5;
r->data=13;
s->data=10;
t->data=11;
head=p;
p->next=q;
q->next=r;
r->next=s;
s->next=t;
t->next=NULL;
 struct node* temp=head;
 printf("The numbers are:\n");
 while(temp!=NULL){
 printf("%d -> ",temp->data);
 if(temp->next->next==NULL){
 temp=temp->next;
 printf("%d\n",temp->data);
                    }
temp=temp->next;
              }
return 0;
}
```



2. Now modify the previous code in such a way so that user can input the values in the given nodes p,q,r,s,t by using loop.

Solution 2:

```
#include<stdio.h>
#include<stdlib.h>
struct node{
int data;
struct node* next;
        };
int main()   {
struct node* head =NULL;
struct node* p =NULL;
struct node* q =NULL;
struct node* r =NULL;
struct node* s =NULL;
struct node* t =NULL;
p=malloc(sizeof(struct node));
q=malloc(sizeof(struct node));
r=malloc(sizeof(struct node));
s=malloc(sizeof(struct node));
t=malloc(sizeof(struct node));
head=p;
p->next=q;
q->next=r;
r->next=s;
s->next=t;
t->next=NULL;
struct node* current=head;
printf("Enter the numbers:\n");
 while(current!=NULL)
{
scanf("%d",&current->data);
current=current->next;
}
 struct node* temp=head;
 printf("The numbers are:\n");
 while(temp!=NULL){
 printf("%d -> ",temp->data);
 if(temp->next->next==NULL){
 temp=temp->next;
 printf("%d\n",temp->data);
                    }
temp=temp->next;
               }
return 0; }
```



3. Now update the same code in such a way so that user can define how many nodes

he/she wants to create then input the values in nodes.

Solution 3:

```
#include<stdio.h>
#include<stdlib.h>
struct node{
int data;
struct node* next;
        };
int main()
{
printf("Enter the number of values:\n");
int n;
scanf("%d",&n);
struct node* head =NULL;
struct node* tmp =NULL;
struct node* newnode =NULL;
head=NULL;
printf("Enter the numbers:\n");
for(int i=0;i<=n;i++){
  if(i==n){
    tmp->next=NULL;
break;
}
newnode=malloc(sizeof(struct node));
 scanf("%d",&newnode->data);
 if(head==NULL){
 tmp=newnode;
 head=tmp;
}else{
tmp->next=newnode;
tmp=newnode;
}
}
struct node* temp=head;
printf("The numbers are:\n");
while(temp!=NULL){
printf("%d -> ",temp->data);
if(temp->next->next==NULL){
temp=temp->next;
printf("%d\n",temp->data);
}
temp=temp->next;
} return 0; }
```