```
//Single Linked list inserting & Deleting at head and tail and  Nth node
#include<stdio.h>
#include<stdlib.h>
void  insert();
void delete();
void print();
int count();
void find();
struct node
        {
                int e;
                struct node* next;
        };
struct node* head;
int main()
{
                        head=NULL;
                int op,k;
        do
                {
                                printf("\t\t\t***Choose any Option***\n");
                                printf("\t1.Insert\t2.Delete \t3.Print\t4.Count\t5.find\t6.Exit\n");
                                scanf("%d",&op);
                                switch(op)
                                {
                                        case 1:insert();
                                                        break;
                                        case 2:delete();
                                                          break;
                                        case     3:print();
                                                                break;
                                        case 4:k= count();
                                                                printf("The no.of Nodes Are %d\n",k);
                                                                break;
                                        case 5:find();
                                                                break;
                                        case 6:break;
                                        default: printf("\n***Invalid Choice***\n");
                                                                 printf("\n*** Think About it ***\n");
                                }
          }while(op!=6);
}
        void insert()
        {
                        int ele,op,i=1,n,s;
                        printf("Enter Element\n");
                        scanf("%d",&ele);
                        if(head==NULL){
                                head= (struct node* )malloc(sizeof(struct node));
                                head->e=ele;
                                head->next=NULL;
                        }
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                else{
                struct node *temp;
                        struct node *ptr=head,*tem1=head;
                temp=(struct node* )malloc(sizeof(struct node));
        temp->e=ele;
        temp->next=NULL;
                printf("1.At head\t2.At Nth node \t3.At tail\t4.Before node 5.After
Node\t6.Before Element\t7.After Element\n");
                scanf("%d",&op);
                        switch(op)
                        {
                        case 1: temp->next=head;
                                head=temp;
                                break;
                        case 2: printf("Enter the Node that u want to insert an
element\n");
                                scanf("%d",&n);
                                while(i<n){
                                        ptr=ptr->next;
                                        i++;
                                        }
                                temp->next=ptr;
                                while(tem1->next!=ptr)
                                        tem1=tem1->next;
                                tem1->next=temp;
                                break;
                        case 3: while(ptr->next!=NULL)
                                ptr=ptr->next;
                                ptr->next=temp;
                                temp->next=NULL;
                                break;
                        case 4:printf("Enter the Node that u want to insert an element
Before tht Node\n");
                                scanf("%d",&n);
                                while(i<n-1){
                                        ptr=ptr->next;
                                        i++;
                                        }
                                temp->next=ptr;
                                while(tem1->next!=ptr)
                                        tem1=tem1->next;
                                tem1->next=temp;
                                break;
                        case 5:printf("Enter the Node that u want to insert an element
After That Node\n");
                                scanf("%d",&n);
                                while(i<n+1){
                                        ptr=ptr->next;
                                        i++;
                                        }
                                temp->next=ptr;
                                while(tem1->next!=ptr)
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                                        tem1=tem1->next;
                                    tem1->next=temp;
                                    break;
                            case 6:printf("Enter ELement You Want to Search\n");
                                    scanf("%d",&s);
                                    while(tem1!=NULL){
                                    if(tem1->e==s){
                                    i=2;
                                    break;
                                    }
                                    else
                                        tem1=tem1->next;
                                    }
                                    if(i==2){
                                    temp->next=tem1;
                                    while(ptr->next!=tem1)
                                            ptr=ptr->next;
                                        ptr->next=temp;
                                        break;
                            case 7: printf("Enter ELement You Want to Search\n");
                                    scanf("%d",&s);
                                    while(tem1!=NULL){
                                    if(tem1->e==s){
                                    i=2;
                                    break;
                                    }
                                    else
                                        tem1=tem1->next;
                                    }
                                    if(i==2){
                                    temp->next=tem1->next;
                                    tem1->next=temp;
                                    }
                                    else
                                    printf("Not FOund\n");
                                    break;
                                }
                }
}
}
 void delete()
 {
                int op,n,i=1,s;
                if(head==NULL)
                        printf("NoT PoSsIbLe\n");
                else
                {
                        struct node *ptr=head,*tem1=head,*tem2=head;
                        printf("1.At head\t2.At Nth node 3.At tail\t4.Before node\t 5.After
node\t6.Before Element\t7.After ELement\n");
                        scanf("%d",&op);
                                switch(op)
```

```
{
case 1:head=head->next;
                break;
case 2:printf("Enter the Node that u want to delete an
element>1\n");
                scanf("%d",&n);
                while(i<n){
                        ptr=ptr->next;
                        i++;
                        }
                while(tem1->next!=ptr)
                        tem1=tem1->next;
                        tem1->next=ptr->next;
                break;
case 3:while(ptr->next!=NULL)
                                ptr=ptr->next;
                struct node *temp1=head;
                while(temp1->next!=ptr)
                                temp1=temp1->next;
                temp1->next=NULL;
                break;
case 4: printf("Enter the Node that u want to delete an
element>1\n");
                scanf("%d",&n);
                while(i<n-1){
                        ptr=ptr->next;
                        i++;
                        }
                while(tem1->next!=ptr)
                        tem1=tem1->next;
                        tem1->next=ptr->next;
                break;
case 5: printf("Enter the Node that u want to delete an
element>1\n");
                scanf("%d",&n);
                while(i<n+1){
                        ptr=ptr->next;
                        i++;
                        }
                while(tem1->next!=ptr)
                        tem1=tem1->next;
                        tem1->next=ptr->next;
                break;
case 6:printf("Enter ELement You Want to Search\n");
                scanf("%d",&s);
                while(tem1!=NULL){
                if(tem1->e==s){
                i=2;
                break;
                }
                else
                        tem1=tem1->next;
```

```
                                                        }
                                                        if(i==2){
                                                                while(ptr->next!=tem1)
                                                                        ptr=ptr->next;
                                                                while(tem2->next!=ptr)
                                                                        tem2=tem2->next;
                                                                tem2->next=tem1;
                                                                }
                                                        else
                                                                printf("Element NoT FoUnD\n");
                                                        break;
                                        case 7:printf("Enter ELement You Want to Search\n");
                                                        scanf("%d",&s);
                                                        while(tem1!=NULL){
                                                        if(tem1->e==s){

                        i=2;

                        break;

                }
                                                        else
                                                                tem1=tem1->next;
                                                        }
                                                        if(i==2){
                                                                        tem1->next=tem1-
>next->next;
                                                                        }
                                                        else
                                                                printf("Element NoT FoUnD\n");
                                                                break;
                                        }
                        }
}

void print()
 {
                struct node *tem=head;
                printf("List is :-\n");
                while(tem!=NULL)
                {
                        printf(" %d",tem->e);
                        tem=tem->next;
                }
                printf("\n");
         }
int count()
{
                int i=0;
                struct node *ptr=head;
                while(ptr!=NULL){
                                ptr=ptr->next;
```

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                        i++;
                        }
        return i;
}
void find()
{
        int s,i=0;
        struct node *tem1=head;
        printf("Enter ELement You Want to Search\n");
        scanf("%d",&s);
        while(tem1!=NULL){
                if(tem1->e==s){
                                                i=1;
                                                break;
                                                }
                else
                        tem1=tem1->next;
                        }
                if(i==1)
                                printf("Element FOund\n");
                else
                                printf("ELement Not Found\n");
}
```

```
//Double Linked list for insertion and Deletion
#include<stdio.h>
#include<stdlib.h>
void  insert();
int delete();
void print();
struct node
        {
                int e;
                struct node* prev;
                struct node* next;
        };
struct node* head;
int main()
{
                        head=NULL;
                int op,k,n;
        do
                {
```

```
                printf("\t\t\t***Choose any Option***\n");
                printf("\t1.Insert \t2.Delete \t3.print\t4.Exit \n");
                scanf("%d",&op);
                switch(op)
                {
                        case 1:insert();
                                        break;
                        case 2:delete();
                                                break;
                        case 3: print();
                                                break;
                        case 4: break;
                        default: printf("\n***Invalid Choice***\n");
                                                 printf("\n*** Think About it ***\n");
                }
          }while(op!=4);
}
        void insert()
        {
                        int ele,i=1,n,op,j,s;
                        if(head==NULL)
                        {
                                printf("Enter Element\n");
                                scanf("%d",&ele);
                                head= (struct node* )malloc(sizeof(struct node));
                                head->e=ele;
                                head->next=NULL;
                                head->prev=NULL;
                                }
                        else
                        {
                                struct node* temp,*ptr=head,*tem1=head,*tem2=head;
                           temp=(struct node* )malloc(sizeof(struct node));
                                printf("Enter Element\n");
                                scanf("%d",&ele);
                                temp->e=ele;
                                printf("1.Head\t2.Tail\t3.Nth node\t4.Before Nth node \t5.After Nth
node\t6.Before element\t7.After  Element\n");
                                scanf("%d",&op);
                                switch(op)
                                {
                                        case 1: temp->prev=NULL;
                                                        temp->next=head;
                                                        while(ptr->next!=NULL)
                                                                ptr=ptr->next;
                                                        ptr->prev=temp;
                                                        head=temp;
                                                        break;
                                        case 2:         while(ptr->next!=NULL)
                                                                ptr=ptr->next;
                                                        ptr->next=temp;
                                                        while(tem1->next!=temp)
```

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                                        tem1=tem1->next;
                                        temp->prev=tem1;
                                        temp->next=NULL;
                                        break;
                                case 3:printf("Enter the Node where u want to place a new
node\n");
                                        scanf("%d",&n);
                                        while(i<n){
                                                ptr=ptr->next;
                                                        i++;
                                                }
                                                temp->next=ptr;
                                        while(tem1->next!=ptr)
                                                tem1=tem1->next;
                                                tem1->next=temp;
                                        while(tem2->next!=tem1)
                                                        tem2=tem2->next;
                                                temp->prev=tem2;
                                        break;
                                case 4: printf("Enter the Node where u want to place a new
node before it\n");
                                        scanf("%d",&n);
                                        while(i<n-1){
                                                ptr=ptr->next;
                                                        i++;
                                                }
                                                temp->next=ptr;
                                        while(tem1->next!=ptr)
                                                tem1=tem1->next;
                                                tem1->next=temp;
                                        while(tem2->next!=tem1)
                                                        tem2=tem2->next;
                                                temp->prev=tem2;
                                        break;
                                case 5: printf("Enter the Node where u want to place a new
node after it\n");
                                        scanf("%d",&n);
                                        while(i<n+1){
                                                ptr=ptr->next;
                                                        i++;
                                                }
                                                temp->next=ptr;
                                        while(tem1->next!=ptr)
                                                tem1=tem1->next;
                                                tem1->next=temp;
                                        while(tem2->next!=tem1)
                                                        tem2=tem2->next;
                                                temp->prev=tem2;
                                        break;
                                case 6:printf("Enter the element that u want to search and
insert ele before it\n");
                                        scanf("%d",&s);
```

```
                                        while(tem1!=NULL){
                                        if(tem1->e==s){

        j=1;

        break;

        }
                                        else

    tem1=tem1->next;
                                                }
                                                if(j==1){
                                                temp->next=tem1;
                                                while(ptr->next!=tem1)
                                                        ptr=ptr->next;
                                                ptr->next=temp;
                                                while(tem2->next!=ptr)
                                                        tem2=tem2->next;
                                                temp->prev=tem2;
                                                }
                                                else
                                                        printf("Element
Not Found\n");
                                                break;
                                case 7: printf("Enter the element that u want to search and
insert ele After it\n");
                                        scanf("%d",&s);
                                        while(tem1!=NULL){
                                        if(tem1->e==s){

        j=1;

        break;

        }
                                        else

    tem1=tem1->next;
                                                }
                                        if(j==1){
                                                temp->next=tem1->next;
                                                tem1->next=temp;
                                                while(ptr->next!=tem1)
                                                        ptr=ptr->next;
                                                temp->prev=ptr;
                                                break;
                                                }
                                        else
                                                printf("Element Not
Found\n");
                                }
```

```
		}
}
int delete()
	{
		int op,i=1,n,s,j;
		struct node *ptr=head,*tem1=head,*tem2=head,*tem3=head;
		if(head==NULL)
			printf("Deletion Not Possible\n");
		else{
				printf("1.Head\t2.Tail\t3.Nth node\t4.Before Nth node \t5.After Nth
node\t6.Before element\t7.After  Element\n");
				scanf("%d",&op);
				switch(op)
				{
					case 1: head=head->next;
							head->prev=NULL;
							break;
					case 2:while(ptr->next!=NULL)
							ptr=ptr->next;
						while(tem1->next!=ptr)
							tem1=tem1->next;
						tem1->next=NULL;
						break;
					case 3:printf("Enter The node\n");
						scanf("%d",&n);
						while(i<n){
							ptr=ptr->next;
							i++;
							}
						while(tem1->next!=ptr)
							tem1=tem1->next;
						tem1->next=ptr->next;
						while(tem2->next!=tem1)
							tem2=tem2->next;
						ptr->next->prev=tem2;
						break;
					case 4:printf("Enter The node\n");
						scanf("%d",&n);
						while(i<n-1){
							ptr=ptr->next;
							i++;
							}
						while(tem1->next!=ptr)
							tem1=tem1->next;
						tem1->next=ptr->next;
						while(tem2->next!=tem1)
							tem2=tem2->next;
						ptr->next->prev=tem2;
						break;
					case 5:printf("Enter The node\n");
						scanf("%d",&n);
						while(i<n+1){
```

```
                                        ptr=ptr->next;
                                        i++;
                                        }
                                while(tem1->next!=ptr)
                                                tem1=tem1->next;
                                tem1->next=ptr->next;
                                while(tem2->next!=tem1)
                                        tem2=tem2->next;
                                ptr->next->prev=tem2;
                                break;
                        case 6:printf("Enter the element that u want to search and
delete ele Before it\n");
                                scanf("%d",&s);
                                 while(tem1!=NULL){
                                if(tem1->e==s){

        j=1;

        break;

        }
                                else

    tem1=tem1->next;
                                        }
                                if(j==1){
                                while(ptr->next!=tem1)
                                        ptr=ptr->next;
                                while(tem2->next!=ptr)
                                        tem2=tem2->next;
                                tem2->next=ptr->next;
                                while(tem3->next!=tem2)
                                        tem3=tem3->next;
                                ptr->next->prev=tem3;
                                }
                                else
                                printf("element Not Found\n");
                                break;
                        case 7: printf("Enter the element that u want to search and
delete ele After it\n");
                                scanf("%d",&s);
                                 while(tem1!=NULL){
                                if(tem1->e==s){

        j=1;

        break;

        }
                                else

    tem1=tem1->next;
```

```
                    }
                if(j==1){
                ptr=tem1->next;
                while(tem2->next!=tem1)
                        tem2=tem2->next;
                ptr->next->prev=tem2;
                tem1->next=tem1->next->next;
                }
                else
                printf("ELement Not Found\n");
                break;
                }
 }
}
 void print()
 {
                struct node *temp=head;
                printf("List is :-\n");
                while(temp!=NULL)
                {
                        printf(" %d",temp->e);
                        temp=temp->next;
                }
                printf("\n");
  }
```