EXP NO:01 IMPLEMENTATION OF LINKED LIST DATE: -08-23

AIM: TO IMPLEMENT SINGLY LINKED LIST DATA STRUCTURE USING C.

MENU DRIVEN PROGRAM TO PERFORM OPERATIONS SUCH AS
I)CREATING FIRST NODE
II)APPENDING NODES
III)ADDING NODE AT THE BEGINNING OF LINKED LIST AND AT SPECIFIC LOCATION
IV)DELETING A NODE IN A LINKED LIST.

Program:

```
#include<stdio.h>

#include<stdlib.h>

struct node
{
	int data;
	struct node *link;
}*q;



void create() //Function to create a singly linked list
{
	struct node *temp;
	int num;
	printf("\nEnter data: ");
	scanf("%d",&num);
	if(q==NULL)
	{
		temp=(struct node *)malloc(sizeof(struct node));
		temp->data=num;
		temp->link=NULL;
		q=temp;
	}
}
void append() //Function to add a node  at the end of a singly linked list
{
	struct node *temp,*r;
	int num;
	printf("\nEnter data: ");
	scanf("%d",&num);
	temp=q;
	while(temp->link!=NULL)
	{
		temp=temp->link;
	}
	r=(struct node *)malloc(sizeof(struct node));
	r->data=num;
	r->link=NULL;
	temp->link=r;
}

void addatbeg() //Function to add a node at the beginning
{
	struct node *temp;
	int num;
	printf("\nEnter data: ");
	scanf("%d",&num);
	temp=(struct node *)malloc(sizeof(struct node));
	temp->data=num;
	temp->link=q;
	q=temp;
```

```
}

void addafter() //add a node at the given position in a linked list
{
	struct node *temp,*r;
	int num,loc;
	printf("\nEnter data: ");
	scanf("%d",&num);
	printf("Enter position: ");
	scanf("%d",&loc);
	r=(struct node *)malloc(sizeof(struct node));
	temp=q;
	r->data=num;
	for(int i=1;i<loc;i++)
	{
		if(temp!=NULL)
		{
		temp=temp->link;
		}

	}
	if(temp==NULL)
		{
			printf("\nError\n");
			return;
		}
	r->link=temp->link;
	temp->link=r;
}

void del() // to delete a node from a singly linked list
{
	struct node *old,*temp;
	int num;
	printf("\nEnter data:");
	scanf("%d",&num);
	temp=q;
	while(temp!=NULL)
	{
		if(temp->data==num)
		{
			if(temp==q) //only used whn deleting a node
			{
				q=q->link;
			}
			else
			{
				old->link=temp->link;
			}
			free(temp);
			return;
		}
		else
		{
			old=temp;
			temp=temp->link;
		} //while

	}
	printf("\n%d element not found",num);
}


void display()
{
	struct node *temp;
```

```
        temp=q;
        while(temp->link!=NULL)
        {

                printf("%d--->",temp->data);
                temp=temp->link;
        }
        printf("%d",temp->data);
}
int main()
{
        int o;
        int con;
        do
        {
                printf("\nEnter 1 to create a singly linked list\nEnter 2 to add a node  at the end of a
singly linked list\nEnter 3 to add a node at the beginning\nEnter 4 to add a node at the given position in
a linked list\nEnter 5 to delete a node from a singly linked list\n");
        scanf("%d",&o);
        switch(o)
        {
        case 1:create();
                display();
                break;
        case 2 : append();
                display();
                break;
        case 3 : addatbeg();
                display();
                break;
        case 4 : addafter();
                display();
                break;
        case 5 : del();
                display();
                break;
        default: printf("\nWrong choice");
                break;
        }
        printf("\nDo you want to continue(1/0)? ");
        scanf("%d",&con);
        }
        while(con==1);



        return 0;
}
```

Output:

```
Enter 1 to create a singly linked list
Enter 2 to add a node  at the end of a singly linked list
Enter 3 to add a node at the beginning
Enter 4 to add a node at the given position in a linked list
Enter 5 to delete a node from a singly linked list
1

Enter data: 12
12
Do you want to continue(1/0)? 1

Enter 1 to create a singly linked list
```

```
Enter 2 to add a node  at the end of a singly linked list
Enter 3 to add a node at the beginning
Enter 4 to add a node at the given position in a linked list
Enter 5 to delete a node from a singly linked list
2

Enter data: 33
12--->33
Do you want to continue(1/0)? 1

Enter 1 to create a singly linked list
Enter 2 to add a node  at the end of a singly linked list
Enter 3 to add a node at the beginning
Enter 4 to add a node at the given position in a linked list
Enter 5 to delete a node from a singly linked list
3

Enter data: 44
44--->12--->33
Do you want to continue(1/0)? 1

Enter 1 to create a singly linked list
Enter 2 to add a node  at the end of a singly linked list
Enter 3 to add a node at the beginning
Enter 4 to add a node at the given position in a linked list
Enter 5 to delete a node from a singly linked list
4

Enter data: 55
Enter position: 1
44--->55--->12--->33
Do you want to continue(1/0)? 1

Enter 1 to create a singly linked list
Enter 2 to add a node  at the end of a singly linked list
Enter 3 to add a node at the beginning
Enter 4 to add a node at the given position in a linked list
Enter 5 to delete a node from a singly linked list
4

Enter data: 56
Enter position: 5

Error
44--->55--->12--->33
Do you want to continue(1/0)? 1

Enter 1 to create a singly linked list
Enter 2 to add a node  at the end of a singly linked list
Enter 3 to add a node at the beginning
Enter 4 to add a node at the given position in a linked list
Enter 5 to delete a node from a singly linked list
5

Enter data:12
44--->55--->33
Do you want to continue(1/0)? 1

Enter 1 to create a singly linked list
Enter 2 to add a node  at the end of a singly linked list
```

Enter 3 to add a node at the beginning
Enter 4 to add a node at the given position in a linked list
Enter 5 to delete a node from a singly linked list
5

Enter data:66

66 element not found44--->55--->33
Do you want to continue(1/0)? 0