S.No: 14	Exp. Name: ***C program which performs all operations on double linked list.***	**Date:2023-07-21**

Aim:

Write a C program that uses functions to perform the following **operations on double linked list**
i) Creation ii) Insertion iii) Deletion iv) Traversal

Source Code:

AllOperationsDLL.c

```
#include<stdio.h>
#include<stdlib.h>
void insert();
void rem();
void display();
struct node{
      int data;
         struct node *next;
            struct node *prev;
}
*head=NULL,*tail=NULL;
typedef struct node *NODE;
void main(){
      int option=0;
         while(1){
                  printf("Operations on doubly linked list\n");
                        printf("1. Insert \n");
                              printf("2.Remove\n");
                                    printf("3. Display\n");
                                          printf("0. Exit\n");
                                                printf("Enter Choice 0-4? : ");
                                                      scanf("%d",&option);
                                                            switch(option){
                                                                        case 1:
                                                                                 inse
rt();

break;

case 2:
        rem();
```

```
                break;
```

```
                    case 3:
```

```
display();
```

```
                    break;
```

```
                                                   case 0:       exit(0);    }
}}void insert(){
                                                          NODE temp,newNode;
                                                          int value;
                                                             newNode=(NODE)mallo
c(sizeof(struct node));
                                                                newNode->prev=NU
LL;
                                                                   newNode->next
=NULL;
                                                                      printf("En
ter number: ");
                                                                         scanf
("%d",&value);
                                                                            newN
ode->data=value;
                                                                               i
f(head==NULL){
            head=newNode;
               tail=newNode;
                  }else{
                           tail->next=newNode;
                                 newNode->prev=tail;
                                       tail=newNode;
                  }
                  }
                  void rem(){
                        int delvalue,item;
                           NODE temp,ptr;
                              printf("Enter number to delete: ");
                                 scanf("%d",&item);
                                    ptr=head;
                                       while(ptr!=NULL){
                                                if(ptr->data==item){
                                                            delvalue=item;
                                                                     break;
                                                }
                                                      ptr=ptr->next;
                                       }
                                          if(delvalue!=item)
                                             printf("%d not found.\n",item);
                                                else{
                                                         if(delvalue==head->data){
                                                                     temp=head;
                                                                              head=he
ad->next;

head->prev=NULL;

free(temp);
                                                         }else{
                                                                     temp=head;
                                                                              while(t
emp->data!=delvalue){
                                                                     temp=temp->next;
                                                         }
```

```
                                                                    temp->prev->next=te
mp->next;
                                                                             temp->next
->prev=temp->prev;
                                                                                      f
ree(temp);
                                                  }

                  }
                  }
                  void display(){
                        NODE temp;
                           temp=head;
                              while(temp!=NULL){
                                       printf("%d\t",temp->data);
                                             temp=temp->next;
                              }
                                 printf("\n");
                  }
```

Execution Results - All test cases have succeeded!

Test Case - 1
User Output
Operations on doubly linked list 1
1.Insert 1
2.Remove 1
3.Display 1
0.Exit 1
Enter Choice 0-4?: 1
Enter number: 15
Operations on doubly linked list 1
1.Insert 1
2.Remove 1
3.Display 1
0.Exit 1
Enter Choice 0-4?: 1
Enter number: 16
Operations on doubly linked list 1
1.Insert 1
2.Remove 1
3.Display 1
0.Exit 1
Enter Choice 0-4?: 1
Enter number: 17
Operations on doubly linked list 1
1.Insert 1
2.Remove 1
3.Display 1
0.Exit 1
Enter Choice 0-4?: 1

```
Enter number:  18
Operations on doubly linked list 3
1.Insert 3
2.Remove 3
3.Display 3
0.Exit 3
Enter Choice 0-4?:  3
15      16      17      18      2
Operations on doubly linked list 2
1.Insert 2
2.Remove 2
3.Display 2
0.Exit 2
Enter Choice 0-4?:  2
Enter number to delete:  19
19 not found 3
Operations on doubly linked list 3
1.Insert 3
2.Remove 3
3.Display 3
0.Exit 3
Enter Choice 0-4?:  3
15      16      17      18      2
Operations on doubly linked list 2
1.Insert 2
2.Remove 2
3.Display 2
0.Exit 2
Enter Choice 0-4?:  2
Enter number to delete:  16
Operations on doubly linked list 0
1.Insert 0
2.Remove 0
3.Display 0
0.Exit 0
Enter Choice 0-4?:  0
```