**PROGRAM-1**

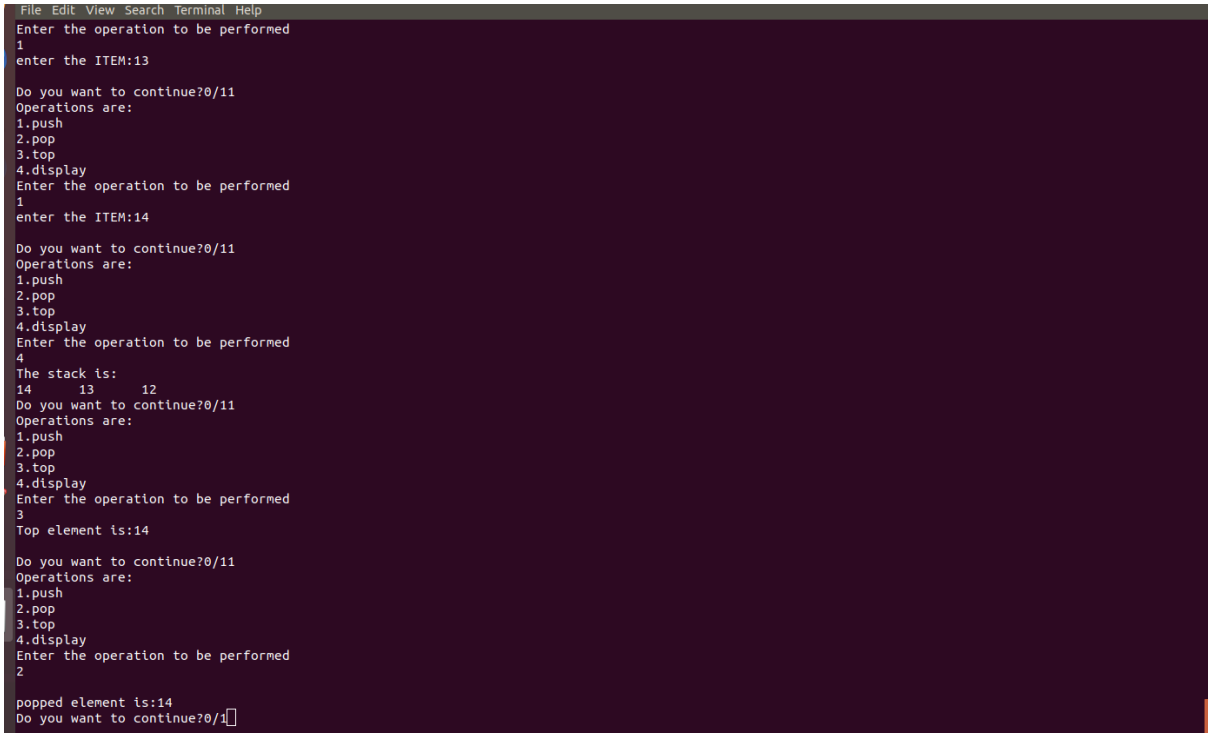
**AIM: Write a program to perform stack operations**

```
#include <stdio.h>
#define N 5
int stack[N];
int top=-1;
void push();
void pop();
void topele();
void display();
void main()
{
char choice;int opt;
do{
printf("Operations are:\n");
printf("1.push\n2.pop\n3.top\n4.display\n");
printf("Enter the operation to be performed\n");
int n;
scanf("%d",&n);
switch(n)
{
case 1:push();
break;
case 2:pop();
break;
case 3:topele();
break;
case 4:display();
break;
default:printf("Invalid operation");
}printf("\nDo you want to continue?0/1");
scanf("%d",&opt);
}while(opt==1);
}void push()
```

```
{
if (top==N-1)
{
printf("stack is full\n");
}
else
{       int ITEM;
printf("enter the ITEM:");
scanf("%d", &ITEM);
top++;
stack[top] = ITEM;
}
}
void pop()
{
if (top==-1)
                        {
printf("stack is empty\n");
                        }
else
{       int ITEM;
ITEM = stack[top];
top--;
                                printf("\npopped element is:%d",ITEM);
}
}
void display()
{
if (top==-1)
                        {
printf("stack is empty\n");
                        }
else
{
```

```
printf("The stack is:\n");
for (int i = top; i >= 0; i--)
printf("%d\t", stack[i]);
}
}
void topele()
{
if (top==-1)
{
                                printf("stack is empty\n");
}
 else
{
printf("Top element is:%d\n",stack[top]);
}
}
```

## Output:


File Edit View Search Terminal Help
Enter the operation to be performed
1
enter the ITEM:13
Do you want to continue?0/11
Operations are:
1.push
2.pop
3.top
4.display
Enter the operation to be performed
1
enter the ITEM:14
Do you want to continue?0/11
Operations are:
1.push
2.pop
3.top
4.display
Enter the operation to be performed
4
The stack is:
14 13 12
Do you want to continue?0/11
Operations are:
1.push
2.pop
3.top
4.display
Enter the operation to be performed
3
Top element is:14
Do you want to continue?0/11
Operations are:
1.push
2.pop
3.top
4.display
Enter the operation to be performed
2
popped element is:14
Do you want to continue?0/1

**PROGRAM-2**

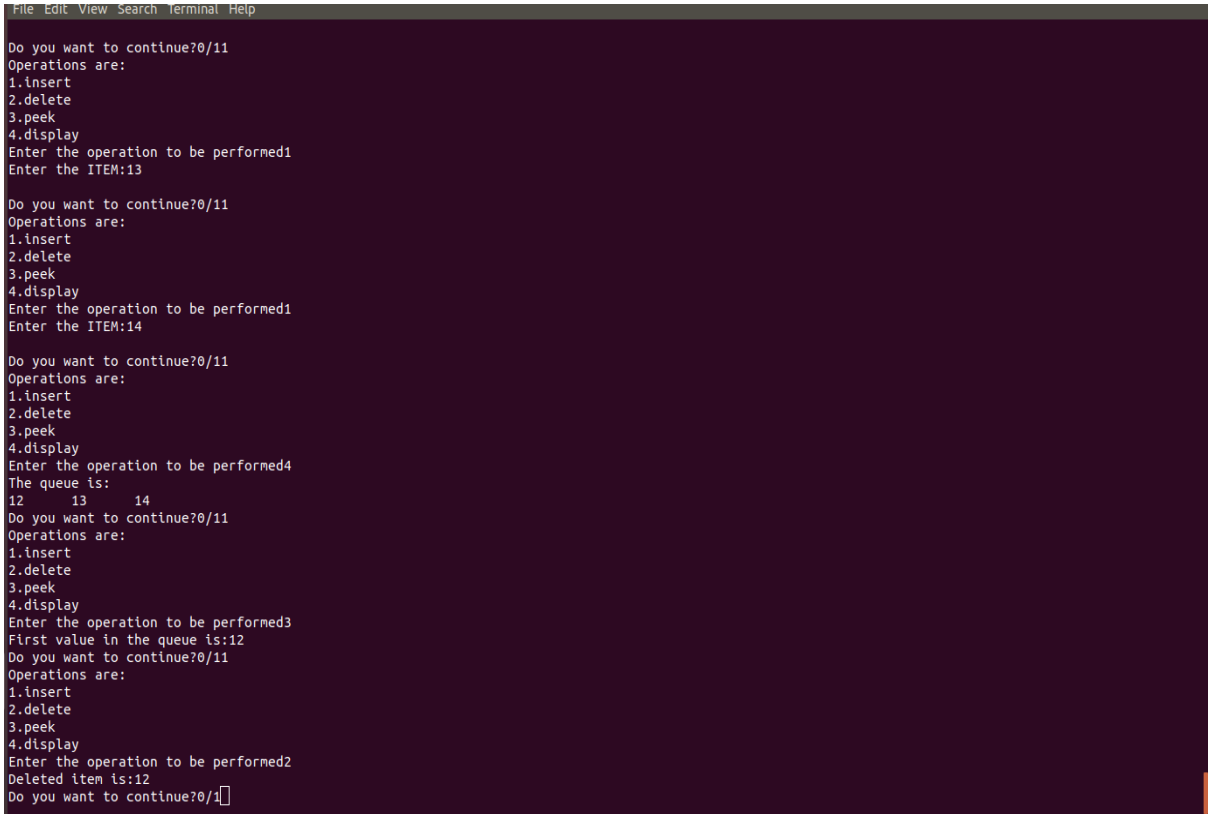
**AIM: Write a program to perform the queue operations**

```
#include <stdio.h>
#define N 5
int QUEUE[N];
int front=-1,rear=-1;
void insert();
int delet();
int peek();
void display();
void main()
{
char choice;int opt;
do
{
printf("Operations are:\n");
printf("1.insert\n2.delete\n3.peek\n4.display\n");
printf("Enter the operation to be performed");
int n;
scanf("%d",&n);
switch(n)
{
case 1:insert();
break;
case 2:val=delet();
if(val!=-1)
printf("Deleted item is:%d",val);
break;
case 3:val=peek();
if(val!=-1)
printf("First value in the queue is:%d",val);
break;
case 4:display();
```

```
break;
default:printf("Invalid operation");
}printf("\nDo you want to continue?0/1");
scanf("%d",&opt);
}while(opt==1);
}
void insert()
{
if (rear==N-1)
{
printf("\nQueue is full\n");
}
elseif(front==-1 && rear==-1)
{
front=rear=0;
}
else
{       int ITEM;
printf("enter the ITEM:");
scanf("%d", &ITEM);
rear++;
QUEUE[rear] = ITEM;
}
}
int delet()
{
if (front==-1 || front>rear)
{
printf("\nqueue is empty\n");
                        return-1;
}
else
{       int val;
val = QUEUE[front];
```

```
front++;
 if(front>rear)
   front=rear=-1;
   return val;
}
}
void display()
{
if (front==-1 || front>rear)
{
printf("\nqueue is empty\n");
 }
else
{
printf("The queue is:\n");
for (int i = front; i <= rear; i++)
printf("%d\t", QUEUE[i]);
}
}
int peek()
{
if (front==-1 || front>rear)
{
printf("\nqueue is empty\n");
                                return-1;
}
else
{
return QUEUE[front];
}
}
```

## Output:


File Edit View Search Terminal Help
Do you want to continue?0/11
Operations are:
1.insert
2.delete
3.peek
4.display
Enter the operation to be performed1
Enter the ITEM:13
Do you want to continue?0/11
Operations are:
1.insert
2.delete
3.peek
4.display
Enter the operation to be performed1
Enter the ITEM:14
Do you want to continue?0/11
Operations are:
1.insert
2.delete
3.peek
4.display
Enter the operation to be performed4
The queue is:
12 13 14
Do you want to continue?0/11
Operations are:
1.insert
2.delete
3.peek
4.display
Enter the operation to be performed3
First value in the queue is:12
Do you want to continue?0/11
Operations are:
1.insert
2.delete
3.peek
4.display
Enter the operation to be performed2
Deleted item is:12
Do you want to continue?0/1

**PROGRAM-3**

**AIM: Write a program to perform the linked list operations**

```
# include<stdio.h>
# include<stdlib.h>
void create();
void display();
void insertbig();
void insertend();
void insertspeci();
void delet_beg();
void delet_end();
void delet_loc();
struct node
{
   int data;
   struct node *next;
}*head,*temp,*new,*q;
int val,ch,opt;
int main()
{
do{
   printf("\n1:create a node\n2:display the list\n3:insert at beginning\n4:insert at end\n5:insert at a
specified location\n");
printf("6. Delete from the beginning\n");
printf("7. Delete from the  end\n");
printf("8. Delete from  a specified location\n");

      printf("enter the choice:");
      scanf("%d",&ch);
      switch(ch)
      {
         case 1:create();
               break;
         case 2:display();
               break;
         case 3:insertbig();
               break;
         case 4:insertend();
               break;
         case 5:insertspeci();
               break;
         case 6:delet_beg();
         break;
        case 7:delet_end();
         break;
        case 8:delet_loc();
         break;
          default:
          printf("wrong choice");
      }
      printf("\ndo you want to continue 1/0:");
      scanf("%d",&opt);
   }while(opt==1);
```

```
}
void create()
{
   new=(struct node*)malloc(sizeof(struct node));
   printf("enter the data:");
   scanf("%d",&val);
   new->data=val;
   new->next=NULL;
   if(head==NULL)
   {
      head=new;
      temp=new;
   }
   else
   {
      temp->next=new;
      temp=new;
   }
}
void display()
{
   temp=head;
   while(temp!=NULL)
   {
      printf("%d\t",temp->data);
      temp=temp->next;
   }

}
void insertbig()
{
   new=(struct node*)malloc(sizeof(struct node));
   printf("enter the data:");
   scanf("%d",&val);
   new->data=val;
   new->next=head;
   head=new;
}
void insertend()
{
int val;
new=(struct node*)malloc(sizeof(struct node));
printf("Enter the data : ");
scanf("%d",&val);

   temp=head;
   while(temp->next!=NULL)
   {
      temp=temp->next;
   }
new->data=val;
new->next=NULL;
temp->next=new;

}
void insertspeci()
```

```
{
   int pos,i;
   new=(struct node*)malloc(sizeof(struct node));
   printf("enter the data:");
   scanf("%d",&val);
   printf("enter the position:");
   scanf("%d",&pos);
   temp=head;
   for(i=0;i<pos-1;i++)
   {
      new->data=val;
      temp=temp->next;
      new->next=temp->next;
      temp->next=new;

   }

}
void delet_beg()
{
temp=head;
head=head->next;
printf("Deleted item is:%d",temp->data);
free(temp);
}
void delet_end()
{
temp=head;
while(temp->next!=NULL)
{
q=temp;
temp=temp->next;
}
q->next=NULL;
printf("Deleted item is:%d",temp->data);
free(temp);
}
void delet_loc()
{
int i,pos;
printf("enter the position:");
scanf("%d",&pos);
q=head;
for(i=0;i<pos-1;i++)
{
q=q->next;
}
q->next=q->next->next;
printf("Deleted item is:%d",q->data);
}
```

## Output:

```
File  Edit  View  Search  Terminal  Help
1:create a node
2:display the list
3:insert at beginning
4:insert at end
5:insert at a specified location
6. Delete from the beginning
7. Delete from the  end
8. Delete from  a specified location
enter the choice:1
enter the data:12

do you want to continue 1/0:1

1:create a node
2:display the list
3:insert at beginning
4:insert at end
5:insert at a specified location
6. Delete from the beginning
7. Delete from the  end
8. Delete from  a specified location
enter the choice:1
enter the data:13

do you want to continue 1/0:1

1:create a node
2:display the list
3:insert at beginning
4:insert at end
5:insert at a specified location
6. Delete from the beginning
7. Delete from the  end
8. Delete from  a specified location
enter the choice:1
enter the data:14

do you want to continue 1/0:1

1:create a node
2:display the list
3:insert at beginning
4:insert at end
5:insert at a specified location
6. Delete from the beginning
```

```
File  Edit  View  Search  Terminal  Help
7. Delete from the  end
8. Delete from  a specified location
enter the choice:1
enter the data:15

do you want to continue 1/0:1

1:create a node
2:display the list
3:insert at beginning
4:insert at end
5:insert at a specified location
6. Delete from the beginning
7. Delete from the  end
8. Delete from  a specified location
enter the choice:1
enter the data:16

do you want to continue 1/0:1

1:create a node
2:display the list
3:insert at beginning
4:insert at end
5:insert at a specified location
6. Delete from the beginning
7. Delete from the  end
8. Delete from  a specified location
enter the choice:2
12      13      14      15      16
do you want to continue 1/0:1

1:create a node
2:display the list
3:insert at beginning
4:insert at end
5:insert at a specified location
6. Delete from the beginning
7. Delete from the  end
8. Delete from  a specified location
enter the choice:8
enter the position:2
Deleted item is:13
do you want to continue 1/0:0
mca27@mca27-HP-Pavilion-Desktop-590-p0xxx:~/lab$ gcc ll1.c
```

**PROGRAM-4**

**AIM: Write a program to perform the doubly linked list operations**

```
 # include<stdio.h>
# include<stdlib.h>
void create();
void insertbig();
void insertend();
void insertspeci();
void delfirst();
void delend();
void delspc();
void display();
struct node
{
    struct node *prev;
    int data;
    struct node *next;
}*head,*tail,*new,*temp;
int val,ch,opt;
void main()
{
do{
    printf("1:Create\n2:insert at beginning\n3:insert at end\n4:insert at a specific location\n5:delete
from the beginning\n6:delete from  the end\n7:delete from a specific position\n8:Display the list\n");

        printf("enter the choice:");
        scanf("%d",&ch);
        switch(ch)
        {
            case 1:create();
                   break;
            case 2:insertbig();
                   break;
            case 3:insertend();
                   break;
            case 4:insertspeci();
                   break;
            case 5:delfirst();
                   break;
            case 6:delend();
                   break;
             case 7:delspc();
                   break;
             case 8:display();
                   break;


             default:
             printf("wrong choice");
        }
        printf("do you want to continue 1/0:");
        scanf("%d",&opt);
    }while(opt==1);
```

```
}
void create()
{
  new=(struct node*)malloc(sizeof(struct node));
  printf("enter the data");
  scanf("%d",&val);
  new->data=val;
  new->next=NULL;
  new->prev=NULL;
  if(head==NULL)
   {
 head=tail=new;
   }
  else{
      tail->next=new;
      new->prev=tail;
      tail=new;
      }
}


void insertbig()
{
  new=(struct node*)malloc(sizeof(struct node));
  printf("enter the data");
  scanf("%d",&val);
  new->data=val;
  new->next=head;
  new->prev=NULL;
 head=new;
}

void insertend()
{
 new=(struct node*)malloc(sizeof(struct node));
    printf("enter the data:");
    scanf("%d",&val);
    new->data=val;
    new->next=NULL;
    temp=head;
    while(temp->next!=NULL)
    {
     temp=temp->next;
    }
    temp->next=new;
    new->prev=temp;
}
void display()
{
  tail=head;
  while(tail!=NULL)
  {
   printf("%d\t",tail->data);
   tail=tail->next;
   }
}
```

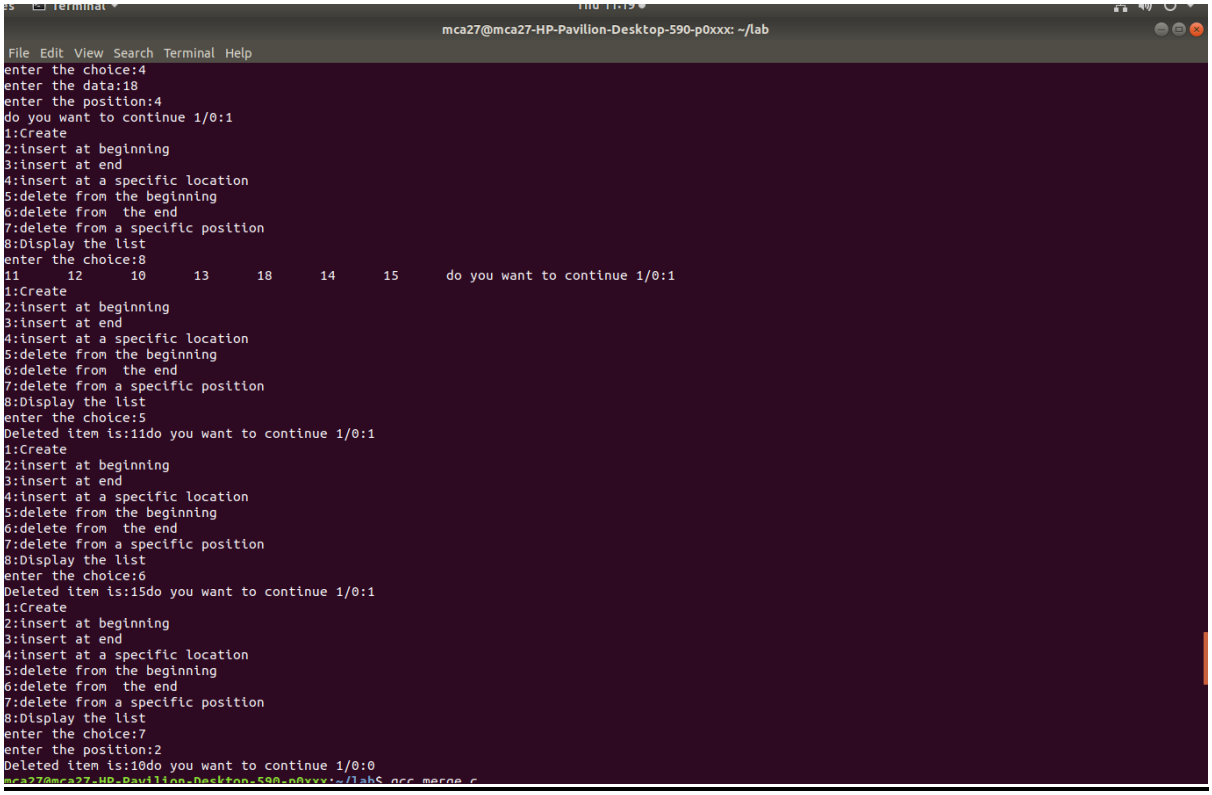
```
 void insertspeci()
{
 int i,pos;
 new=(struct node*)malloc(sizeof(struct node));
    printf("enter the data:");
    scanf("%d",&val);
    printf("enter the position:");
    scanf("%d",&pos);
  new->data=val;
  temp=head;
    for(i=0;i<pos-1;i++)
    {

       temp=temp->next;
}
       new->next=temp->next;
       temp->next=new;
       new->prev=temp;
}
void delfirst()
{
 temp=head;
 head=temp->next;
 head->prev=NULL;
 printf("Deleted item is:%d",temp->data);
 free(temp);
}
void delend()
{
 temp=head;
 while(temp->next!=NULL)
 {
  temp=temp->next;
 }
 temp->prev->next=NULL;
 printf("Deleted item is:%d",temp->data);
 free(temp);
}
void delspc()
{
 int i,pos;
    printf("enter the position:");
    scanf("%d",&pos);
   temp=head;
  for(i=0;i<pos-1;i++)
    {
        temp=temp->next;
    }
  temp->next=temp->next->next;
  printf("Deleted item is:%d",temp->data);
  free(temp);
}
```

## Output:

```
mca27@mca27-HP-Pavilion-Desktop-590-p0xxx:~/lab$ ./a.out
1:Create
2:insert at beginning
3:insert at end
4:insert at a specific location
5:delete from the beginning
6:delete from  the end
7:delete from a specific position
8:Display the list
enter the choice:1
enter the data12
do you want to continue 1/0:1
1:Create
2:insert at beginning
3:insert at end
4:insert at a specific location
5:delete from the beginning
6:delete from  the end
7:delete from a specific position
8:Display the list
enter the choice:1
enter the data13
do you want to continue 1/0:1
1:Create
2:insert at beginning
3:insert at end
4:insert at a specific location
5:delete from the beginning
6:delete from  the end
7:delete from a specific position
8:Display the list
enter the choice:1
enter the data14
do you want to continue 1/0:1
1:Create
2:insert at beginning
3:insert at end
4:insert at a specific location
5:delete from the beginning
6:delete from  the end
7:delete from a specific position
8:Display the list
enter the choice:2
enter the data11
do you want to continue 1/0:1
```

```
ies  Terminal                    Thu 11:18 ●
mca27@mca27-HP-Pavilion-Desktop-590-p0xxx: ~/lab
File  Edit  View  Search  Terminal  Help
1:Create
2:insert at beginning
3:insert at end
4:insert at a specific location
5:delete from the beginning
6:delete from  the end
7:delete from a specific position
8:Display the list
enter the choice:3
enter the data:15
do you want to continue 1/0:1
1:Create
2:insert at beginning
3:insert at end
4:insert at a specific location
5:delete from the beginning
6:delete from  the end
7:delete from a specific position
8:Display the list
enter the choice:4
enter the data:10
enter the position:2
do you want to continue 1/0:1
1:Create
2:insert at beginning
3:insert at end
4:insert at a specific location
5:delete from the beginning
6:delete from  the end
7:delete from a specific position
8:Display the list
enter the choice:8
11      12      10      13      14      15      do you want to continue 1/0:1
1:Create
2:insert at beginning
3:insert at end
4:insert at a specific location
5:delete from the beginning
6:delete from  the end
7:delete from a specific position
8:Display the list
enter the choice:4
enter the data:18
enter the position:4
do you want to continue 1/0:1
```


mca27@mca27-HP-Pavilion-Desktop-590-p0xxx: ~/lab
File Edit View Search Terminal Help
enter the choice:4
enter the data:18
enter the position:4
do you want to continue 1/0:1
1:Create
2:insert at beginning
3:insert at end
4:insert at a specific location
5:delete from the beginning
6:delete from the end
7:delete from a specific position
8:Display the list
enter the choice:8
11 12 10 13 18 14 15 do you want to continue 1/0:1
1:Create
2:insert at beginning
3:insert at end
4:insert at a specific location
5:delete from the beginning
6:delete from the end
7:delete from a specific position
8:Display the list
enter the choice:5
Deleted item is:11do you want to continue 1/0:1
1:Create
2:insert at beginning
3:insert at end
4:insert at a specific location
5:delete from the beginning
6:delete from the end
7:delete from a specific position
8:Display the list
enter the choice:6
Deleted item is:15do you want to continue 1/0:1
1:Create
2:insert at beginning
3:insert at end
4:insert at a specific location
5:delete from the beginning
6:delete from the end
7:delete from a specific position
8:Display the list
enter the choice:7
enter the position:2
Deleted item is:10do you want to continue 1/0:0