6. Write a program to implement operations on singly linked list.

Program:

```
#include<stdio.h>
#include<conio.h>
#include<stdlib.h>
struct node
{
int data;
struct node *link;
};
struct node *head;
void InsertBegin();
void InsertatEnd();
void InsertInBetween();
void DeleteBegin();
void DeleteEnd();
void DeleteInBetween();
void display();
int main()
{
head = (struct node *)malloc(sizeof(struct node *));
head=NULL;
int c=0;
do
{
printf("\n\nSingly Linked List IMPLEMENTATION PROGRAM \n ");
printf("MENU\n ");
printf("-------\n ");
printf("\n ");
printf("Singly Linked List Operations\n ");
printf("-------------\n ");
printf("\n ");
```

```
printf("1. Insert from begin\n ");
printf("2. Insert at End\n ");
printf("3. Insert InBetween\n ");
printf("4. Delete from Begin\n ");
printf("5. Delete at End\n ");
printf("6. Delete Inbetween\n ");
printf("7. Display\n ");
printf("8. EXIT\n ");
printf("\n ");
printf("Select your choice \n ");
scanf("%d",&c);
switch(c)
{
case 1 : InsertBegin();
break;
case 2 : InsertatEnd();
break;
case 3 : InsertInBetween();
break;
case 4 : DeleteBegin();
break;
case 5 : DeleteEnd();
break;
case 6 : DeleteInBetween();
break;
case 7 : display();
break;
default : printf("Exiting \n");
break;
}
}
while(c<8);
```

```
return 0;
}
void InsertBegin()
{
int x;
struct node *temp;
temp = (struct node *)malloc(sizeof(struct node *));
if (temp == NULL)
printf("Overflow\n");
else
{
printf("Enter Node value : ");
scanf("%d",&x);
temp->data=x;
temp->link=head;
head=temp;
temp=NULL;
printf("\n Inserted Node from Begin\n");
}}
void InsertInBetween()
{
int x,y;
struct node *temp,*current;
temp=(struct node*)malloc(sizeof(struct node*));
if(temp==NULL)
printf("\n overflow \n");
else if (head==NULL)
{
printf("Enter the value to insert \n");
scanf("%d",&x);
temp->data=x;
temp->link=NULL;
```

```
head=temp;
printf("Node Inserted Successfully\n");
temp=NULL;
}
else
{
printf("Enter the value to insert \n");
scanf("%d",&x);
printf("Enter the after node \n");
scanf("%d",&y);
current=head;
temp->data=x;
temp->link=NULL;
while(current->data!=y)
current=current->link;
temp->link=current->link;
current->link = temp;
/*head=temp;*/
temp=NULL;
current=NULL;
printf("Node inserted \n");
}}
void InsertatEnd()
{
int x,y;
struct node *temp,*current;
temp=(struct node*)malloc(sizeof(struct node*));
if(temp==NULL)
printf("\n overflow \n");
else if (head==NULL)
{
printf("Enter the value to insert \n");
```

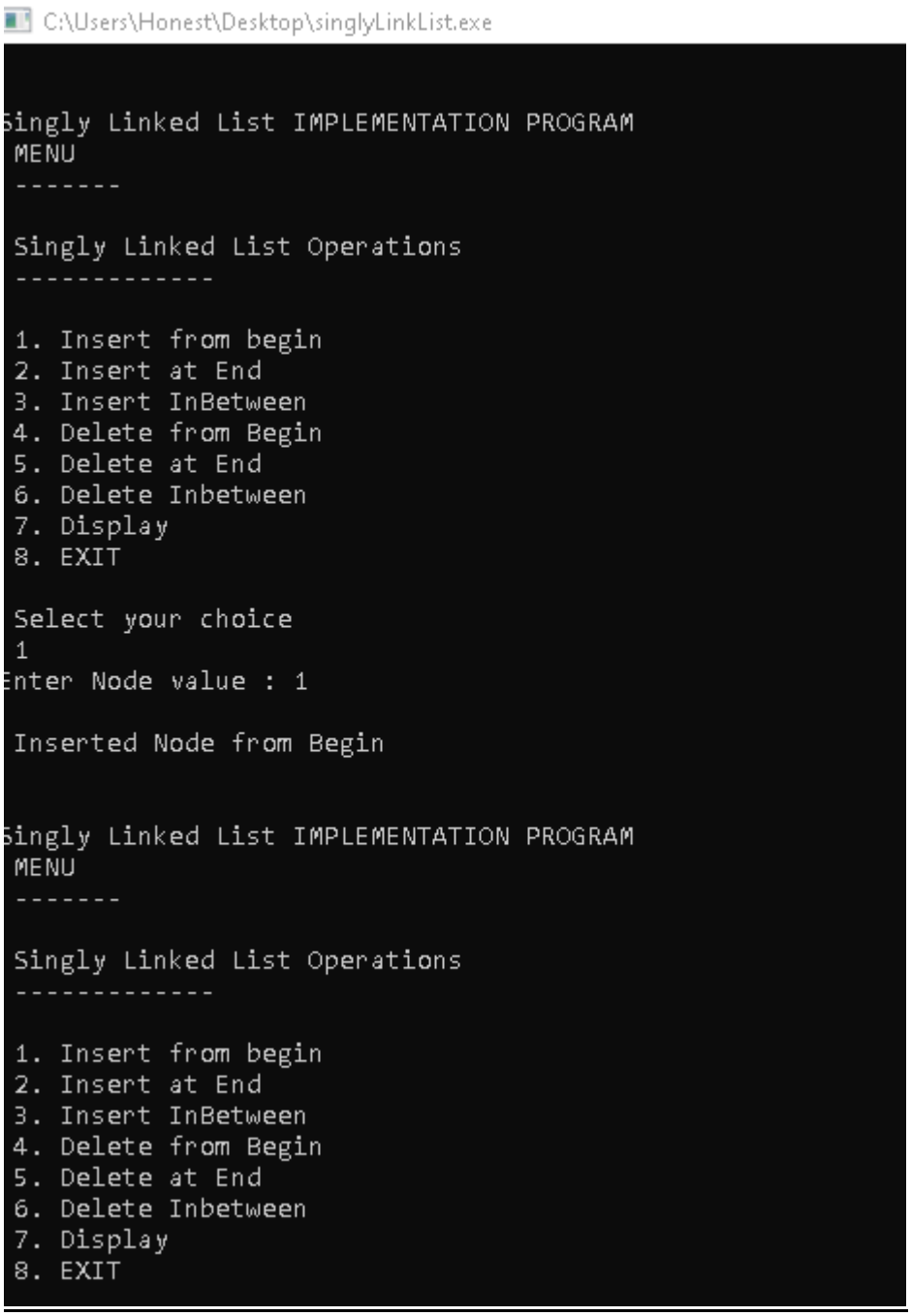
```
scanf("%d",&x);
temp->data=x;
temp->link=NULL;
head=temp;
printf("Node Inserted Successfully\n");
temp=NULL;
}
else
{
printf("Enter the value to insert \n");
scanf("%d",&x);
temp->data=x;
temp->link=NULL;
current=head;
while(current->link!=NULL)
current=current->link;
current->link=temp;
current=NULL;
temp=NULL;
printf("Node Inserted Successfully\n");
}}
void DeleteBegin()
{
struct node *temp;
int x;
if (head==NULL)
printf("Singly Linked list is empty \n");
else
{
temp=head;
x=temp->data;
head=head->link;
```

```
temp->link=NULL;
printf("The deleted node is %d",x);
free(temp);
}
}
void DeleteEnd()
{ int x;
struct node *current1, *current2, *temp;
if(head==NULL)
printf("list is empty \n");
else if(head->link==NULL)
{
temp=head;
x=temp->data;
head=NULL;
free(temp);
printf("The only node of the list deleted is %d\n",x);
}
else
{
current1=head;
while(current1->link!=NULL)
{
current2=current1;
current1=current1->link;
}
current2->link=NULL;
x=current1->data;
free(current1);
printf("\n Deleted node from the last is %d\n",x);
}
}
```

```
void DeleteInBetween()
{
int x;
struct node *c1, *c2, *temp;
if(head==NULL)
printf("List is empty \n");
else if(head->link==NULL)
{temp=head;
x=temp->data;
head=NULL;
printf("The only node is deleted is %d \n",x);
free(temp);
}
else
{
printf("Enter the node to be deleted \n");
scanf("%d", &x);
c1=head;
while(c1->data!=x)
{
c2=c1;
c1=c1->link;
}
x=c1->data;
c2->link=c1->link;
c1->link=NULL;
free(c1);
printf("The given node is deleted is %d \n",x);
}
}
void display()
{
```

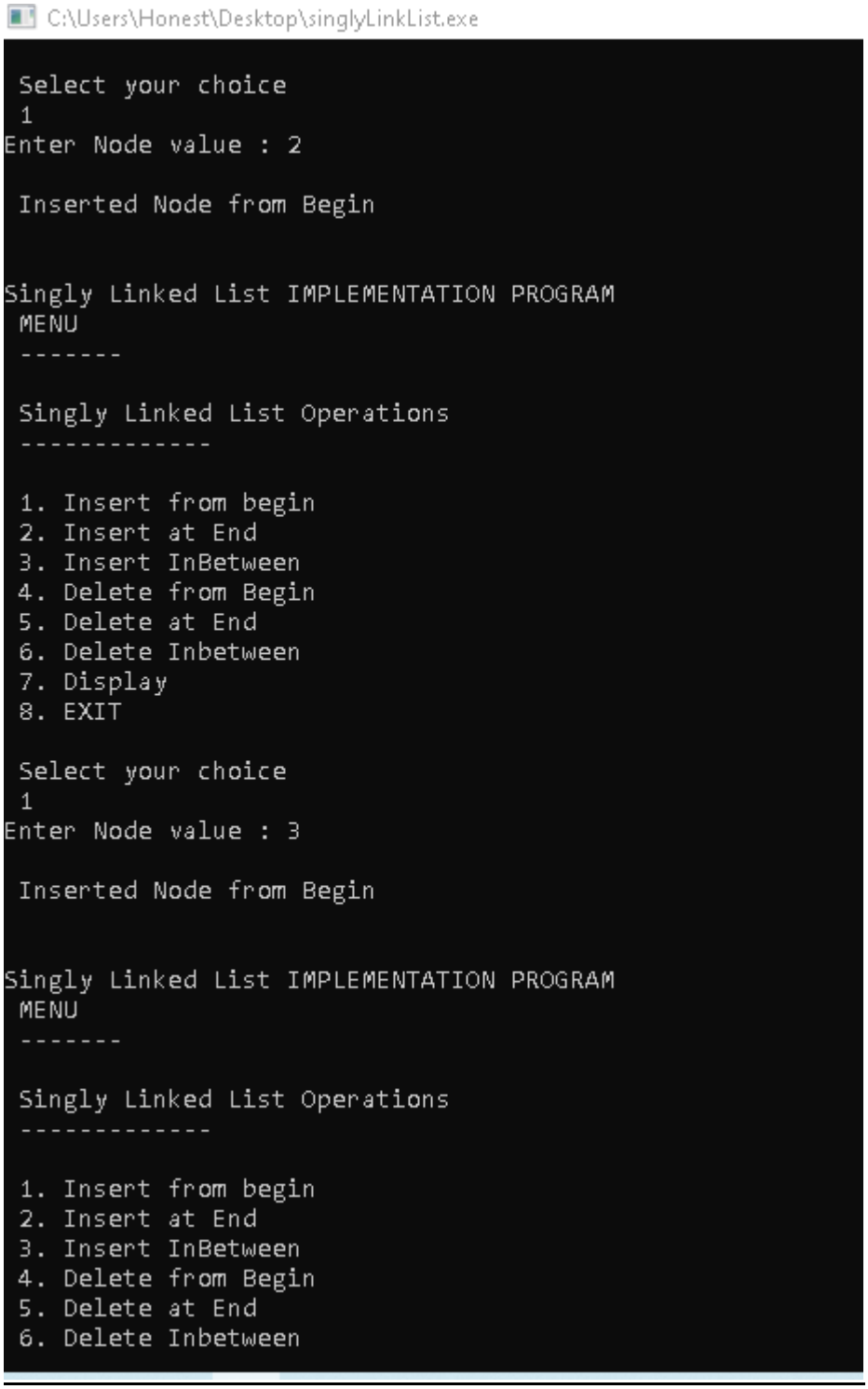
```
struct node *current;
current =head;
if (head == NULL)
printf("Linked list Emptyn");
else
{
printf("\n\nSingly Linked is : \n");
while (current !=NULL)
{
printf("%d ->",current->data);
current=current->link;
}
}
}
```

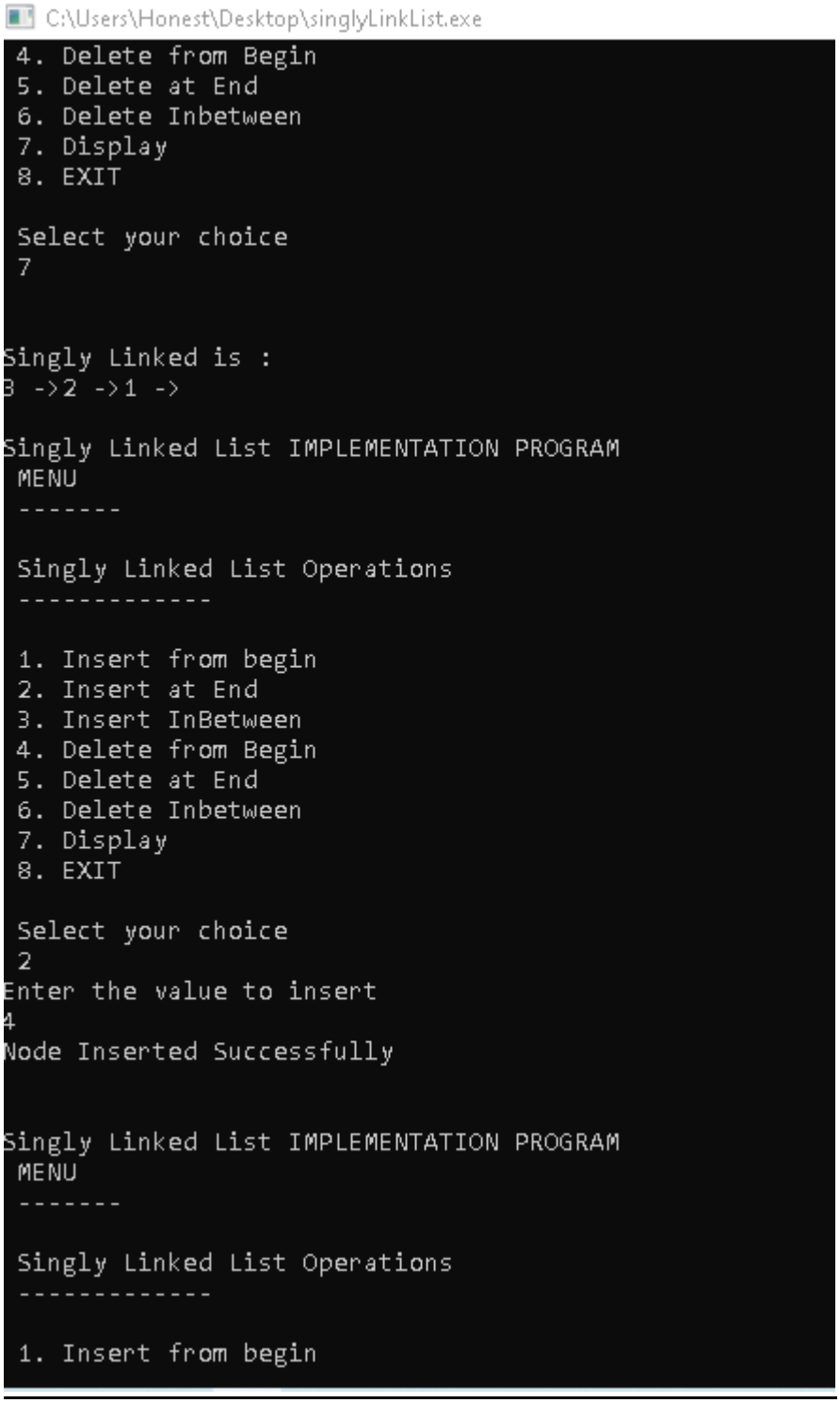
OUTPUT:

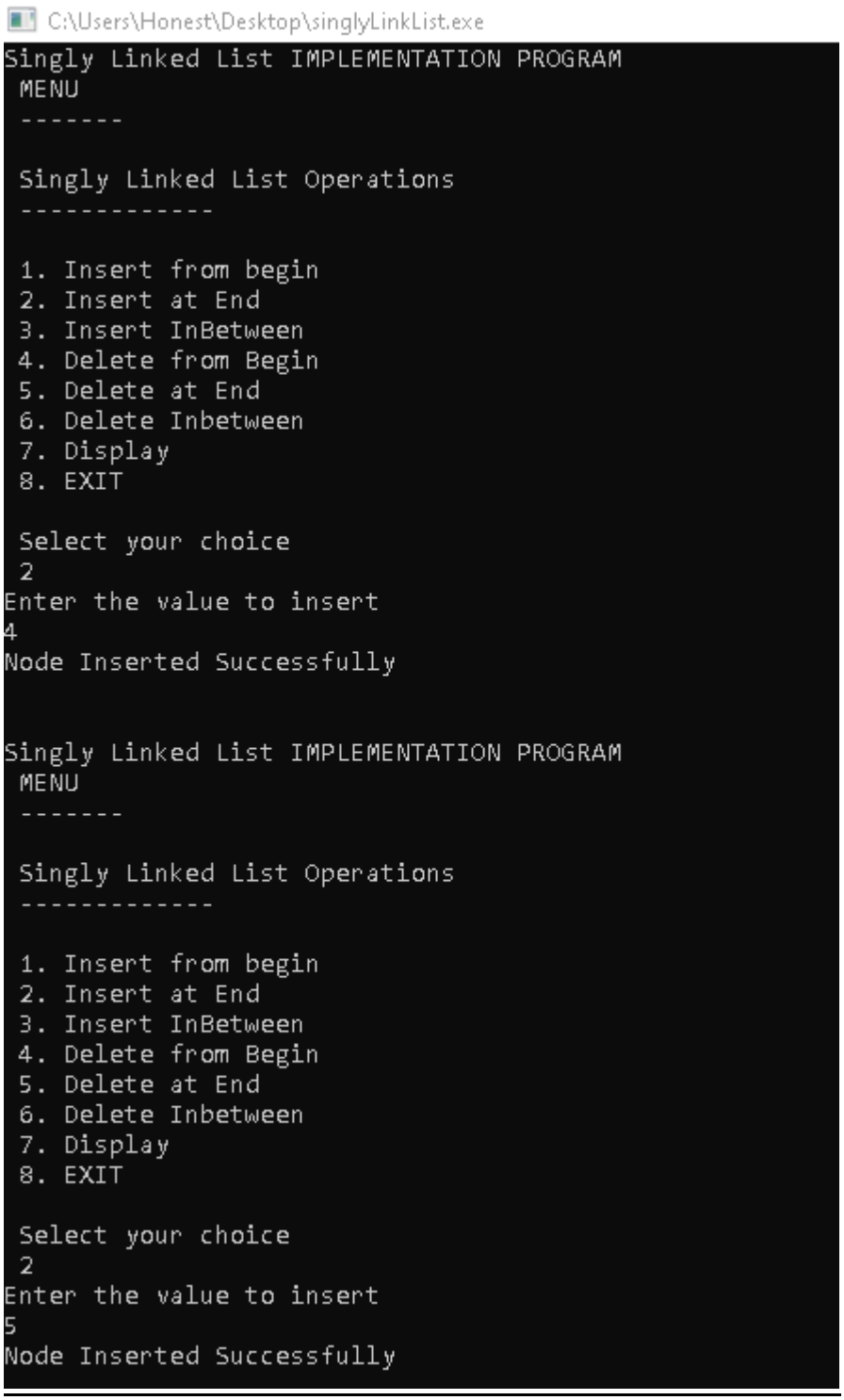

C:\Users\Honest\Desktop\singlyLinkList.exe
Singly Linked List IMPLEMENTATION PROGRAM
MENU

Singly Linked List Operations
----
1. Insert from begin
2. Insert at End
3. Insert InBetween
4. Delete from Begin
5. Delete at End
6. Delete Inbetween
7. Display
8. EXIT
Select your choice
1
Enter Node value : 1
Inserted Node from Begin
Singly Linked List IMPLEMENTATION PROGRAM
MENU

Singly Linked List Operations
----
1. Insert from begin
2. Insert at End
3. Insert InBetween
4. Delete from Begin
5. Delete at End
6. Delete Inbetween
7. Display
8. EXIT

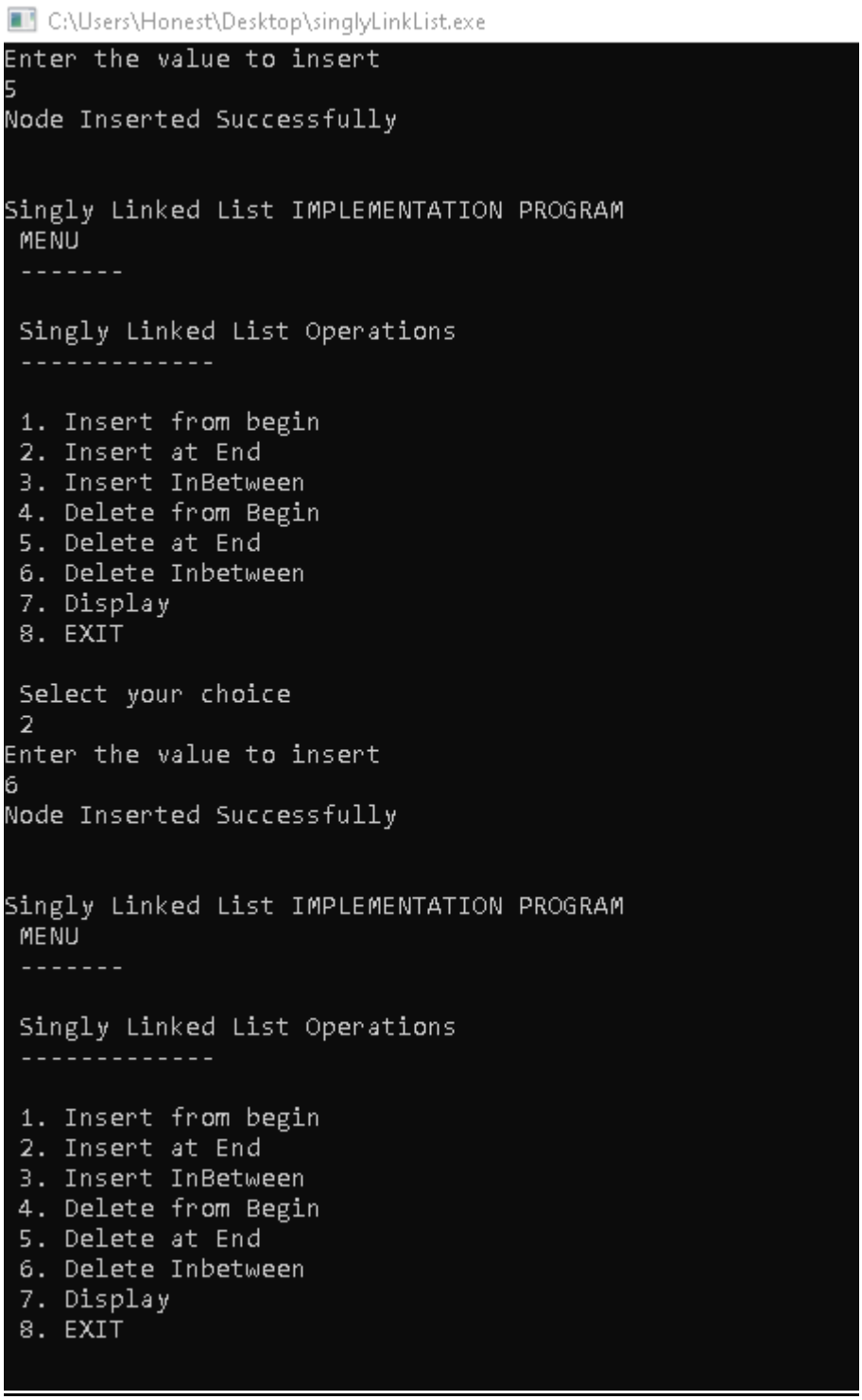

C:\Users\Honest\Desktop\singlyLinkList.exe
Select your choice
1
Enter Node value : 2
Inserted Node from Begin
Singly Linked List IMPLEMENTATION PROGRAM
MENU
Singly Linked List Operations
1. Insert from begin
2. Insert at End
3. Insert InBetween
4. Delete from Begin
5. Delete at End
6. Delete Inbetween
7. Display
8. EXIT
Select your choice
1
Enter Node value : 3
Inserted Node from Begin
Singly Linked List IMPLEMENTATION PROGRAM
MENU
Singly Linked List Operations
1. Insert from begin
2. Insert at End
3. Insert InBetween
4. Delete from Begin
5. Delete at End
6. Delete Inbetween


C:\Users\Honest\Desktop\singlyLinkList.exe
4. Delete from Begin
5. Delete at End
6. Delete Inbetween
7. Display
8. EXIT
Select your choice
7
Singly Linked is :
3 ->2 ->1 ->
Singly Linked List IMPLEMENTATION PROGRAM
MENU
Singly Linked List Operations
1. Insert from begin
2. Insert at End
3. Insert InBetween
4. Delete from Begin
5. Delete at End
6. Delete Inbetween
7. Display
8. EXIT
Select your choice
2
Enter the value to insert
4
Node Inserted Successfully
Singly Linked List IMPLEMENTATION PROGRAM
MENU
Singly Linked List Operations
1. Insert from begin


C:\Users\Honest\Desktop\singlyLinkList.exe
Singly Linked List IMPLEMENTATION PROGRAM
MENU

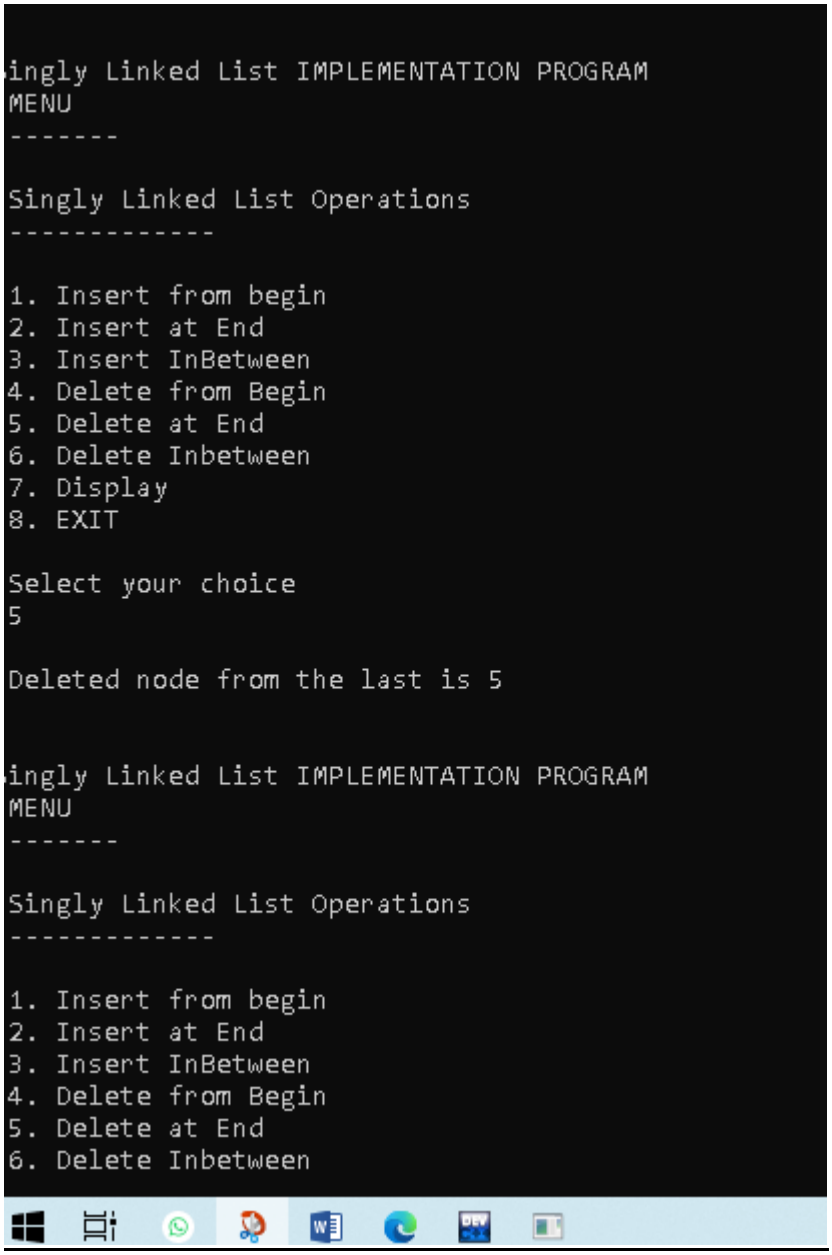
Singly Linked List Operations
----
1. Insert from begin
2. Insert at End
3. Insert InBetween
4. Delete from Begin
5. Delete at End
6. Delete Inbetween
7. Display
8. EXIT
Select your choice
2
Enter the value to insert
4
Node Inserted Successfully
Singly Linked List IMPLEMENTATION PROGRAM
MENU

Singly Linked List Operations
----
1. Insert from begin
2. Insert at End
3. Insert InBetween
4. Delete from Begin
5. Delete at End
6. Delete Inbetween
7. Display
8. EXIT
Select your choice
2
Enter the value to insert
5
Node Inserted Successfully


C:\Users\Honest\Desktop\singlyLinkList.exe
Enter the value to insert
5
Node Inserted Successfully
Singly Linked List IMPLEMENTATION PROGRAM
MENU
Singly Linked List Operations
1. Insert from begin
2. Insert at End
3. Insert InBetween
4. Delete from Begin
5. Delete at End
6. Delete Inbetween
7. Display
8. EXIT
Select your choice
2
Enter the value to insert
6
Node Inserted Successfully
Singly Linked List IMPLEMENTATION PROGRAM
MENU
Singly Linked List Operations
1. Insert from begin
2. Insert at End
3. Insert InBetween
4. Delete from Begin
5. Delete at End
6. Delete Inbetween
7. Display
8. EXIT

```
 -------------

 1. Insert from begin
 2. Insert at End
 3. Insert InBetween
 4. Delete from Begin
 5. Delete at End
 6. Delete Inbetween
 7. Display
 8. EXIT

 Select your choice
 7


Singly Linked is :
3 ->2 ->1 ->4 ->7 ->5 ->6 ->

Singly Linked List IMPLEMENTATION PROGRAM
 MENU
 -------

 Singly Linked List Operations
 -------------

 1. Insert from begin
 2. Insert at End
 3. Insert InBetween
 4. Delete from Begin
 5. Delete at End
 6. Delete Inbetween
 7. Display
 8. EXIT

 Select your choice
 4
The deleted node is 3

Singly Linked List IMPLEMENTATION PROGRAM
 MENU
 -------

 Singly Linked List Operations
 -------------
```

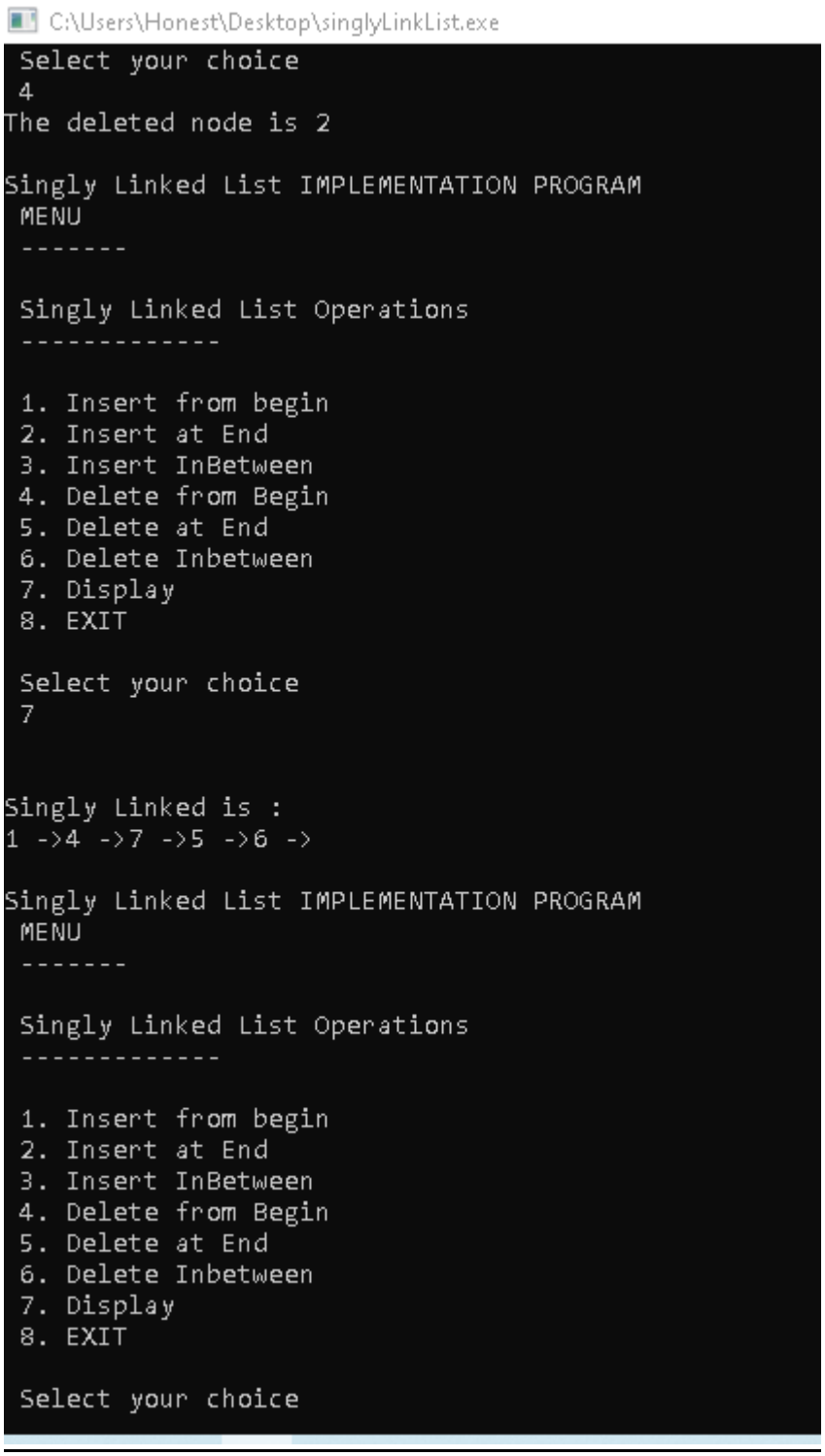
```
 Select your choice
 7


Singly Linked is :
1 ->4 ->7 ->5 ->6 ->

Singly Linked List IMPLEMENTATION PROGRAM
 MENU
 -------

 Singly Linked List Operations
 -------------

 1. Insert from begin
 2. Insert at End
 3. Insert InBetween
 4. Delete from Begin
 5. Delete at End
 6. Delete Inbetween
 7. Display
 8. EXIT

 Select your choice
 5

 Deleted node from the last is 6


Singly Linked List IMPLEMENTATION PROGRAM
 MENU
 -------

 Singly Linked List Operations
 -------------

 1. Insert from begin
```

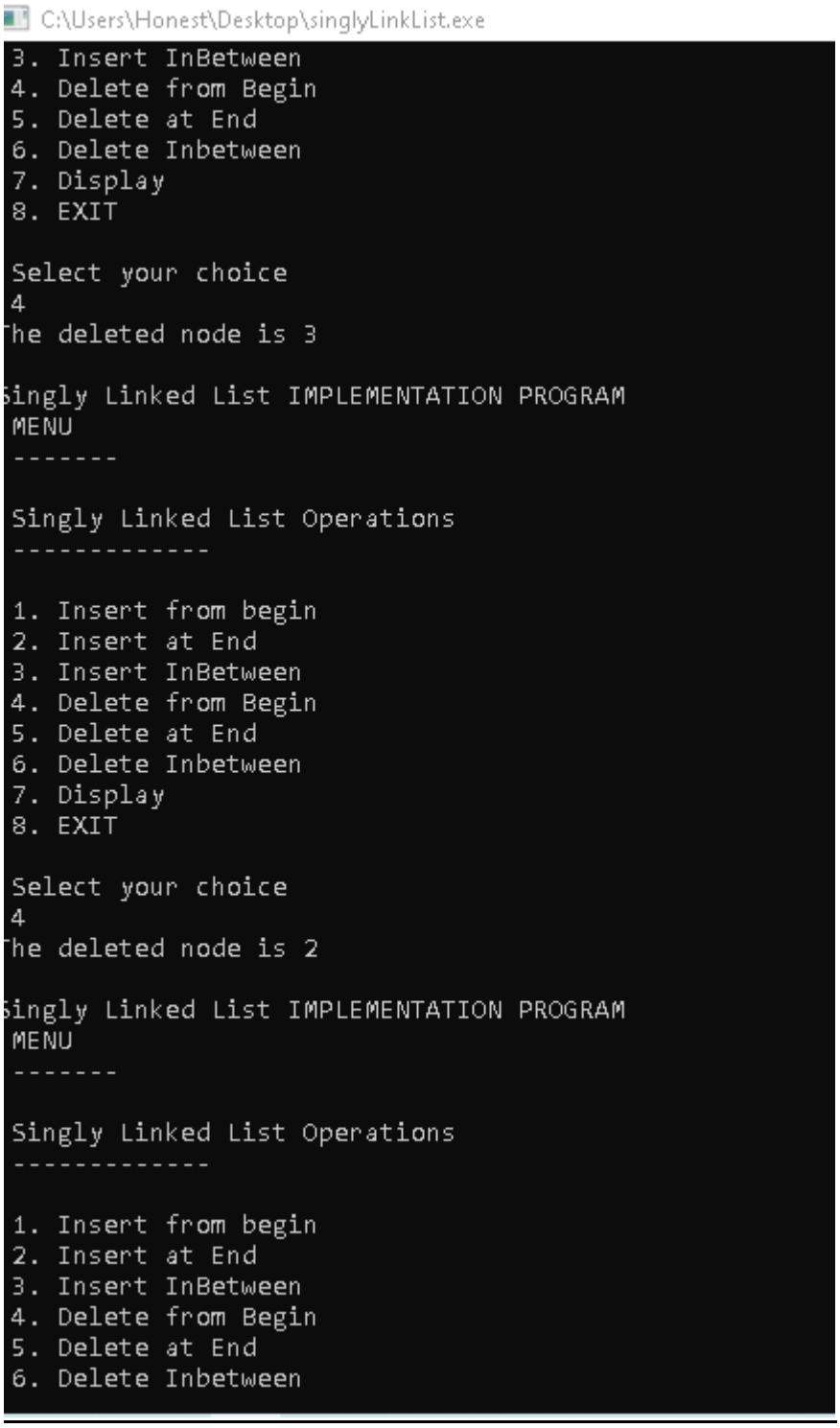

ingly Linked List IMPLEMENTATION PROGRAM
MENU

Singly Linked List Operations
----
1. Insert from begin
2. Insert at End
3. Insert InBetween
4. Delete from Begin
5. Delete at End
6. Delete Inbetween
7. Display
8. EXIT
Select your choice
5
Deleted node from the last is 5
ingly Linked List IMPLEMENTATION PROGRAM
MENU

Singly Linked List Operations
----
1. Insert from begin
2. Insert at End
3. Insert InBetween
4. Delete from Begin
5. Delete at End
6. Delete Inbetween

```
 Select your choice
 6
Enter the node to be deleted
4
The given node is deleted is 4


Singly Linked List IMPLEMENTATION PROGRAM
 MENU
 -------

 Singly Linked List Operations
 -------------

 1. Insert from begin
 2. Insert at End
 3. Insert InBetween
 4. Delete from Begin
 5. Delete at End
 6. Delete Inbetween
 7. Display
 8. EXIT

 Select your choice
 7


Singly Linked is :
1 ->7 ->

Singly Linked List IMPLEMENTATION PROGRAM
 MENU
 -------

 Singly Linked List Operations
 -------------

 1. Insert from begin
 2. Insert at End
 3. Insert InBetween
 4. Delete from Begin
 5. Delete at End
```


C:\Users\Honest\Desktop\singlyLinkList.exe
Select your choice
4
The deleted node is 2
Singly Linked List IMPLEMENTATION PROGRAM
MENU
Singly Linked List Operations
1. Insert from begin
2. Insert at End
3. Insert InBetween
4. Delete from Begin
5. Delete at End
6. Delete Inbetween
7. Display
8. EXIT
Select your choice
7
Singly Linked is :
1 ->4 ->7 ->5 ->6 ->
Singly Linked List IMPLEMENTATION PROGRAM
MENU
Singly Linked List Operations
1. Insert from begin
2. Insert at End
3. Insert InBetween
4. Delete from Begin
5. Delete at End
6. Delete Inbetween
7. Display
8. EXIT
Select your choice


C:\Users\Honest\Desktop\singlyLinkList.exe
3. Insert InBetween
4. Delete from Begin
5. Delete at End
6. Delete Inbetween
7. Display
8. EXIT
Select your choice
4
The deleted node is 3
Singly Linked List IMPLEMENTATION PROGRAM
MENU
Singly Linked List Operations
1. Insert from begin
2. Insert at End
3. Insert InBetween
4. Delete from Begin
5. Delete at End
6. Delete Inbetween
7. Display
8. EXIT
Select your choice
4
The deleted node is 2
Singly Linked List IMPLEMENTATION PROGRAM
MENU
Singly Linked List Operations
1. Insert from begin
2. Insert at End
3. Insert InBetween
4. Delete from Begin
5. Delete at End
6. Delete Inbetween

```
 Select your choice
 7


Singly Linked is :
1 ->4 ->7 ->

Singly Linked List IMPLEMENTATION PROGRAM
 MENU
 -------

 Singly Linked List Operations
 -------------

 1. Insert from begin
 2. Insert at End
 3. Insert InBetween
 4. Delete from Begin
 5. Delete at End
 6. Delete Inbetween
 7. Display
 8. EXIT
```