```
// Single linked list code        1BM19CS141
#include<stdio.h>
#include<stdlib.h>
struct node{
int info;
struct node *link;
};
typedef struct node *NODE;
NODE getnode(){
NODE x;
x=(NODE)malloc(sizeof(struct node));
if(x==NULL){
printf("Memory full\n");
exit(0);
}
return x;
}
void freenode(NODE x){
free(x);
}
NODE insert_front(NODE first,int item){
NODE temp;
temp=getnode();
temp->info=item;
temp->link=NULL;
if(first==NULL)
return temp;
temp->link=first;
first=temp;
return first;
}
```

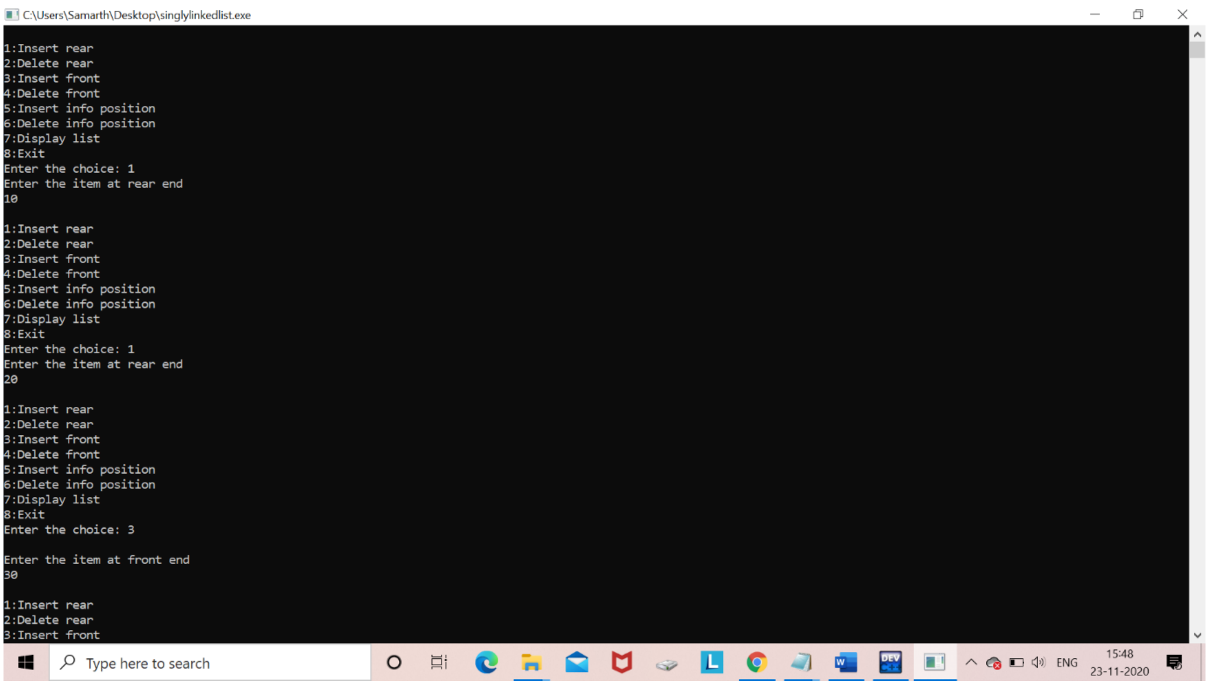
```
NODE delete_front(NODE first){
NODE temp;
if(first==NULL){
printf("List is empty cannot delete\n");
return first;
}
temp=first;
temp=temp->link;
printf("Item deleted at front end is %d\n",first->info);
free(first);
return temp;
}
NODE insert_rear(NODE first,int item){
NODE temp,cur;
temp=getnode();
temp->info=item;
temp->link=NULL;
if(first==NULL)
return temp;
cur=first;
while(cur->link!=NULL)
cur=cur->link;
cur->link=temp;
return first;
}
NODE delete_rear(NODE first){
NODE cur,prev;
if(first==NULL){
printf("List is empty cannot delete\n");
return first;
}
```

```
if(first->link==NULL){
printf("Item deleted is %d\n",first->info);
free(first);
return NULL;
}
prev=NULL;
cur=first;
while(cur->link!=NULL){
prev=cur;
cur=cur->link;
}
printf("Item deleted at rear end is %d",cur->info);
free(cur);
prev->link=NULL;
return first;
}
NODE insert_pos(int item,int pos,NODE first){
NODE temp,cur,prev;
int count;
temp=getnode();
temp->info=item;
temp->link=NULL;
if(first==NULL&&pos==1){
return temp;
}
if(first==NULL){
printf("Invalid position\n");
return first;
}
if(pos==1){
temp->link=first;
```

```
first=temp;

return temp;

}

count=1;

prev=NULL;

cur=first;

while(cur!=NULL&&count!=pos){

prev=cur;

cur=cur->link;

count++;

}

if(

count==pos){

prev->link=temp;

temp->link=cur;

return first;

}

printf("Invalid position\n");

return first;

}

NODE delete_pos(int pos,NODE first){

NODE cur;

NODE prev;

int count,flag=0;

if(first==NULL || pos<0){

printf("Invalid position\n");

return NULL;

}

if(pos==1){

cur=first;

first=first->link;
```

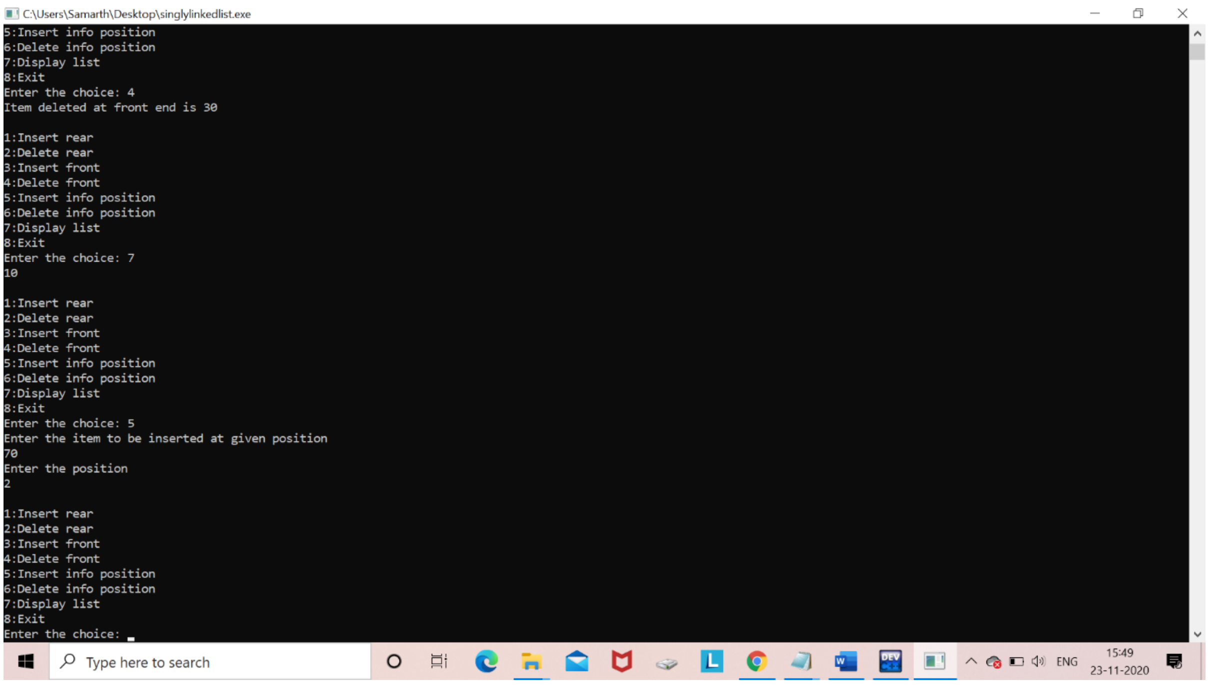
```
freenode(cur);

return first;

}

prev=NULL;

cur=first;

count=1;

while(cur!=NULL){

if(count==pos){

flag=1;

break;

}

count++;

prev=cur;

cur=cur->link;

}

if(flag==0){

printf("Invalid position\n");

return first;

}

printf("Item deleted at given position is %d\n",cur->info);

prev->link=cur->link;

freenode(cur);

return first;

}

void display(NODE first){

NODE temp;

if(first==NULL)

printf("List empty cannot display items\n");

for(temp=first;temp!=NULL;temp=temp->link){

printf("%d\n",temp->info);

}
```

```
}
void main()
{
int item,choice,key,pos;
int count=0;
NODE first=NULL;
for(;;){
printf("\n1:Insert rear\n2:Delete rear\n3:Insert front\n4:Delete front\n5:Insert info
position\n6:Delete info position\n7:Display list\n8:Exit\n");
printf("Enter the choice: ");
scanf("%d",&choice);
switch(choice){
case 1:printf("Enter the item at rear end\n");
scanf("%d",&item);
first=insert_rear(first,item);
break;
case 2:first=delete_rear(first);
break;
case 3:printf("\nEnter the item at front end\n");
scanf("%d",&item);
first=insert_front(first,item);
break;
case 4:first=delete_front(first);
break;
case 5:printf("Enter the item to be inserted at given position\n");
scanf("%d",&item);
printf("Enter the position\n");
scanf("%d",&pos);
first=insert_pos(item,pos,first);
break;
case 6:printf("Enter the position\n");
scanf("%d",&pos);
first=delete_pos(pos,first);
break;
case 7:display(first);
break;
default:exit(0);
break;
}
}
}
```

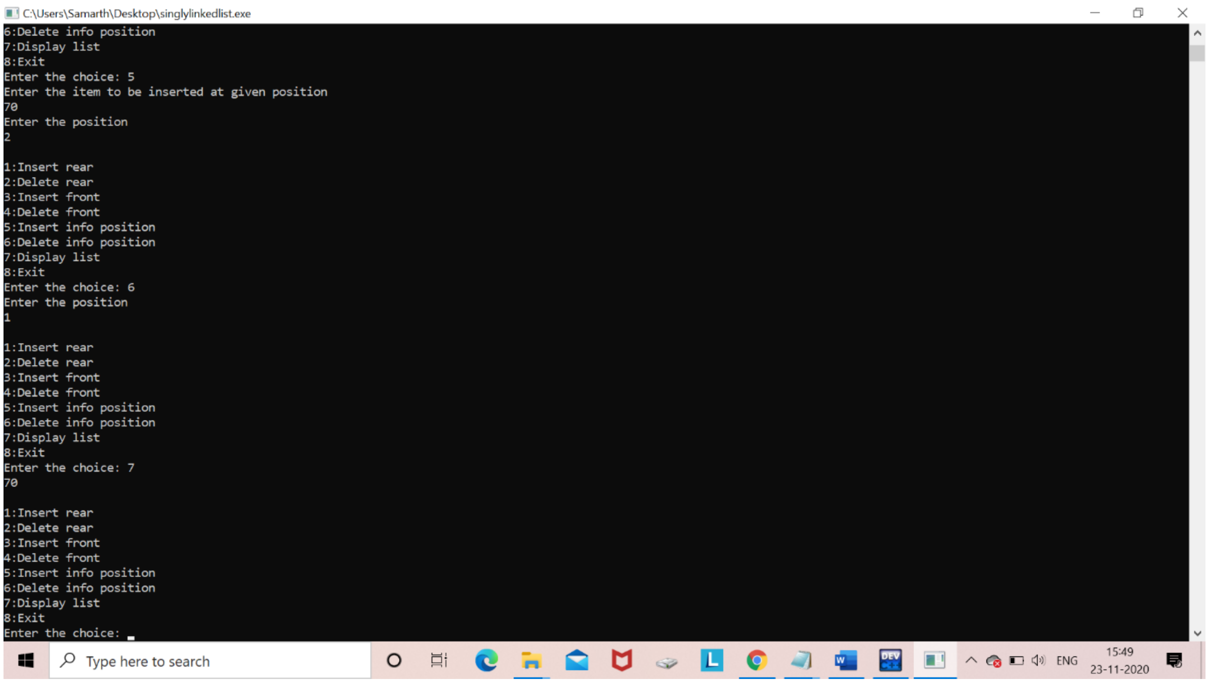


C:\Users\Samarth\Desktop\singlylinkedlist.exe

```
1:Insert rear
2:Delete rear
3:Insert front
4:Delete front
5:Insert info position
6:Delete info position
7:Display list
8:Exit
Enter the choice: 1
Enter the item at rear end
10

1:Insert rear
2:Delete rear
3:Insert front
4:Delete front
5:Insert info position
6:Delete info position
7:Display list
8:Exit
Enter the choice: 1
Enter the item at rear end
20

1:Insert rear
2:Delete rear
3:Insert front
4:Delete front
5:Insert info position
6:Delete info position
7:Display list
8:Exit
Enter the choice: 3

Enter the item at front end
30

1:Insert rear
2:Delete rear
3:Insert front
```



```
5:Insert info position
6:Delete info position
7:Display list
8:Exit
Enter the choice: 4
Item deleted at front end is 30

1:Insert rear
2:Delete rear
3:Insert front
4:Delete front
5:Insert info position
6:Delete info position
7:Display list
8:Exit
Enter the choice: 7
10

1:Insert rear
2:Delete rear
3:Insert front
4:Delete front
5:Insert info position
6:Delete info position
7:Display list
8:Exit
Enter the choice: 5
Enter the item to be inserted at given position
70
Enter the position
2

1:Insert rear
2:Delete rear
3:Insert front
4:Delete front
5:Insert info position
6:Delete info position
7:Display list
8:Exit
Enter the choice: _
```



```
6:Delete info position
7:Display list
8:Exit
Enter the choice: 5
Enter the item to be inserted at given position
70
Enter the position
2

1:Insert rear
2:Delete rear
3:Insert front
4:Delete front
5:Insert info position
6:Delete info position
7:Display list
8:Exit
Enter the choice: 6
Enter the position
1

1:Insert rear
2:Delete rear
3:Insert front
4:Delete front
5:Insert info position
6:Delete info position
7:Display list
8:Exit
Enter the choice: 7
70

1:Insert rear
2:Delete rear
3:Insert front
4:Delete front
5:Insert info position
6:Delete info position
7:Display list
8:Exit
Enter the choice: _
```