WEEK 5:SINGLY LINKED LIST

PROGRAM

```
#include<stdio.h>
#include<conio.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("mem 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\n");

return first;

}

temp=first;

temp=temp->link;

printf("Item deleted at FRONT END=%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;
```

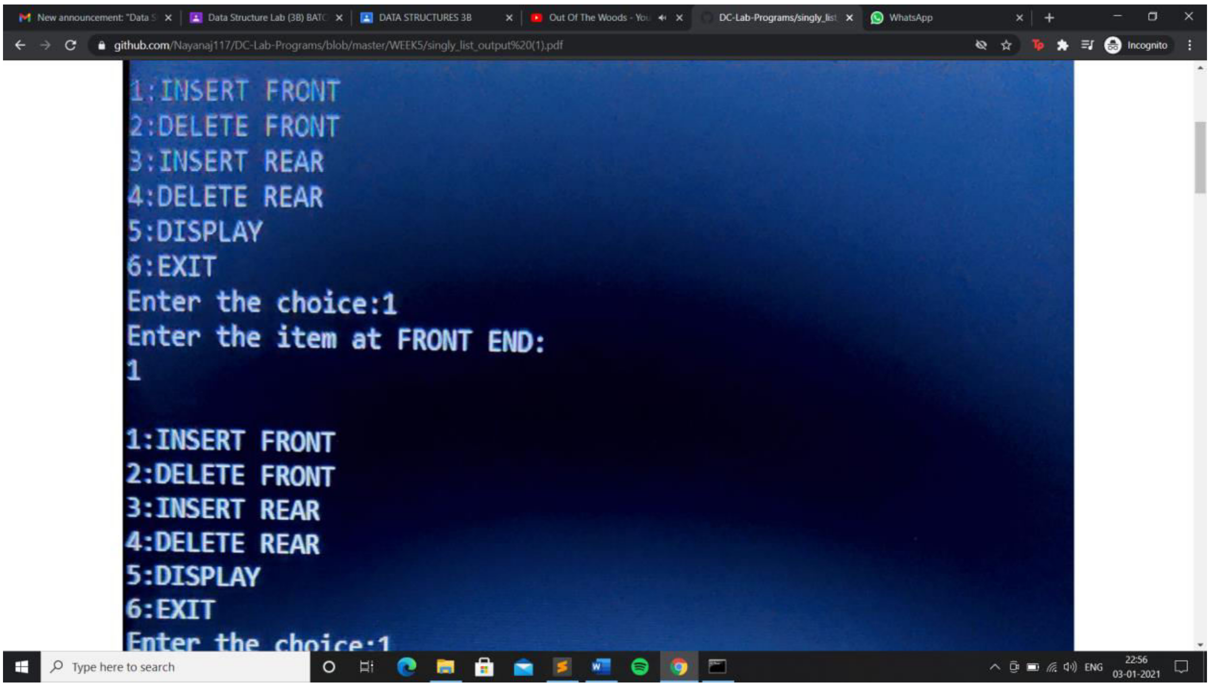
```
cur=first;
while(cur->link!=NULL)
 cur=cur->link;
cur->link=temp;
return first;
}
NODE delete_rear(NODE first)
{
NODE cur,prev;
if(first==NULL)
{
printf("List is EMPTY\n");
return first;
}
if(first->link==NULL)
{
printf("Item deleted is %d\n",first->info);
free(first);
return NULL;
}
prev=NULL;
cur=first;
while(cur->link!=NULL)
{
prev=cur;
cur=cur->link;
}
printf("Item deleted at REAR END %d",cur->info);
free(cur);
prev->link=NULL;
return first;
```

```
}
void display(NODE first)
{
 NODE temp;
 if(first==NULL)
 printf("List EMPTY cannot DISPLAY\n");
 for(temp=first;temp!=NULL;temp=temp->link)
  {
  printf("%d\n",temp->info);
  }
}
NODE delete_pos(int pos 23, NODE first)
{
NODE cur;
NODE prev;
int count;
if(first==NULL || pos<=0)
{
printf("invalid position\n");
return NULL;
}
if (pos==1) similar to key== f->I
{
cur=first;
 first=first->link;
freenode(cur);
return first;
}
prev=NULL;
cur=first;
count=1;
```

```
while(cur!=NULL)
{23==23
if(count==pos) break;
prev=cur;
cur=cur->link;
count++;
}
if(count!=pos)
{
  printf(“invalid position\n”);
   return first;
}
if(count!=pos)
{
  printf(“invalid position specified\n”);
  return first;
}
 Pos found so delete the node
prev->link=cur->link;
 freenode(cur);
return first;
}


void main()
{
int item,choice,pos;
NODE first=NULL;
for(;;)
{
printf("\n1:INSERT FRONT\n2:DELETE FRONT\n3:INSERT REAR\n4:DELETE
REAR\n5:DISPLAY\n6:EXIT\n");
printf("Enter the choice:");
scanf("%d",&choice);
switch(choice)
 {
  case 1:printf("Enter the item at FRONT END:\n");
              scanf("%d",&item);
              first=insert_front(first,item);
              break;
  case 2:first=delete_front(first);
              break;
  case 3:printf("Enter the item at REAR END:\n");
              scanf("%d",&item);
              first=insert_rear(first,item);
              break;
  case 4:first=delete_rear(first);
              break;
  case 5:display(first);
              break;
 default:exit(0);
              break;
 }
}
getch();
}
```

OUTPUT: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github.com/Nayanaj117/DC-Lab-Programs/blob/master/WEEK5/singly_list_output%20(1).pdf
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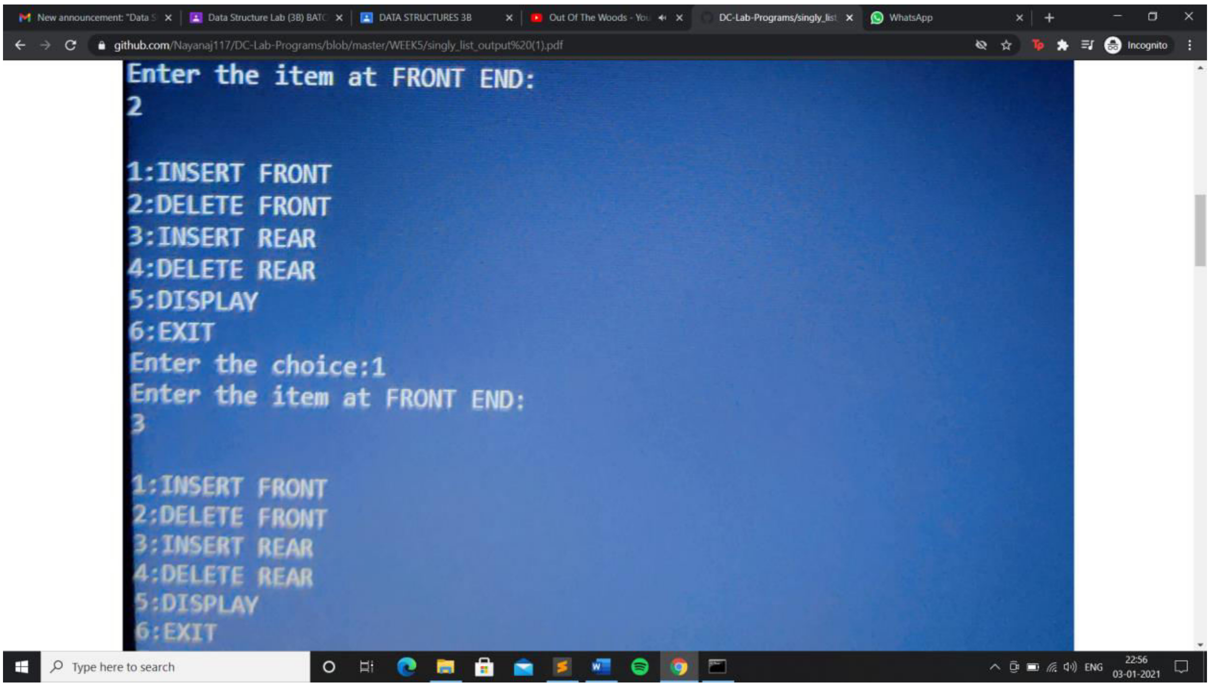
```
1:INSERT FRONT
2:DELETE FRONT
3:INSERT REAR
4:DELETE REAR
5:DISPLAY
6:EXIT
Enter the choice:1
Enter the item at FRONT END:
1

1:INSERT FRONT
2:DELETE FRONT
3:INSERT REAR
4:DELETE REAR
5:DISPLAY
6:EXIT
Enter the choice:1
```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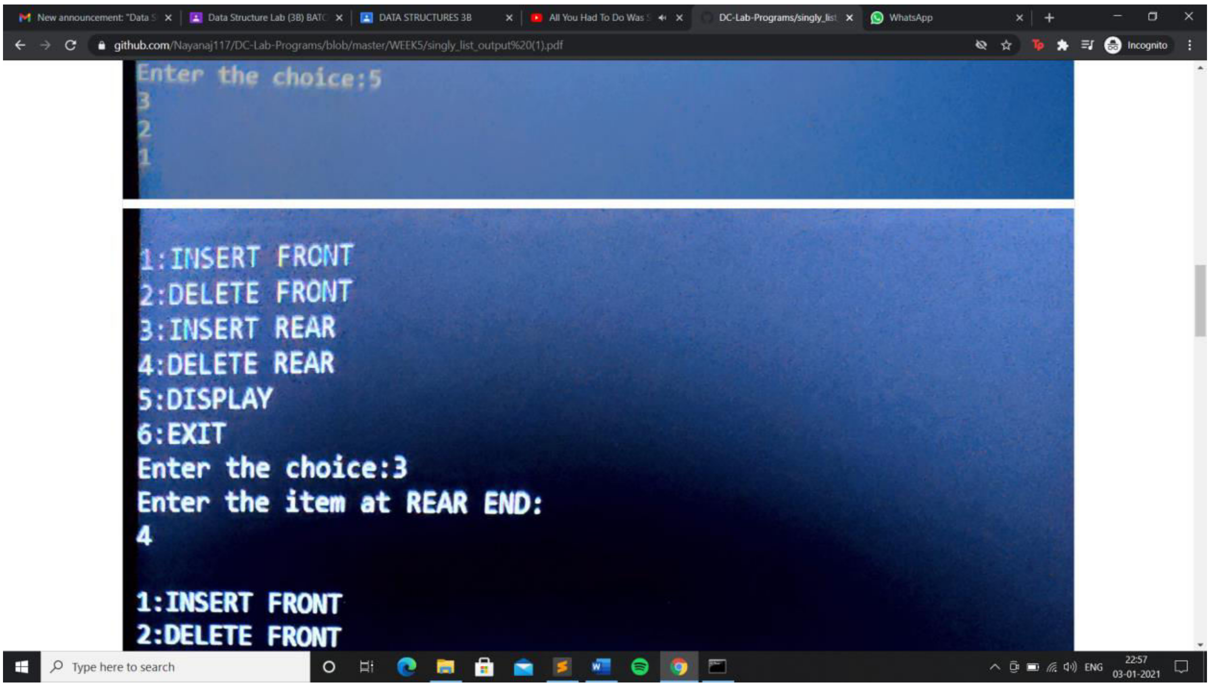
```
Enter the item at FRONT END:
2

1:INSERT FRONT
2:DELETE FRONT
3:INSERT REAR
4:DELETE REAR
5:DISPLAY
6:EXIT
Enter the choice:1
Enter the item at FRONT END:
3

1:INSERT FRONT
2:DELETE FRONT
3:INSERT REAR
4:DELETE REAR
5:DISPLAY
6:EXIT
```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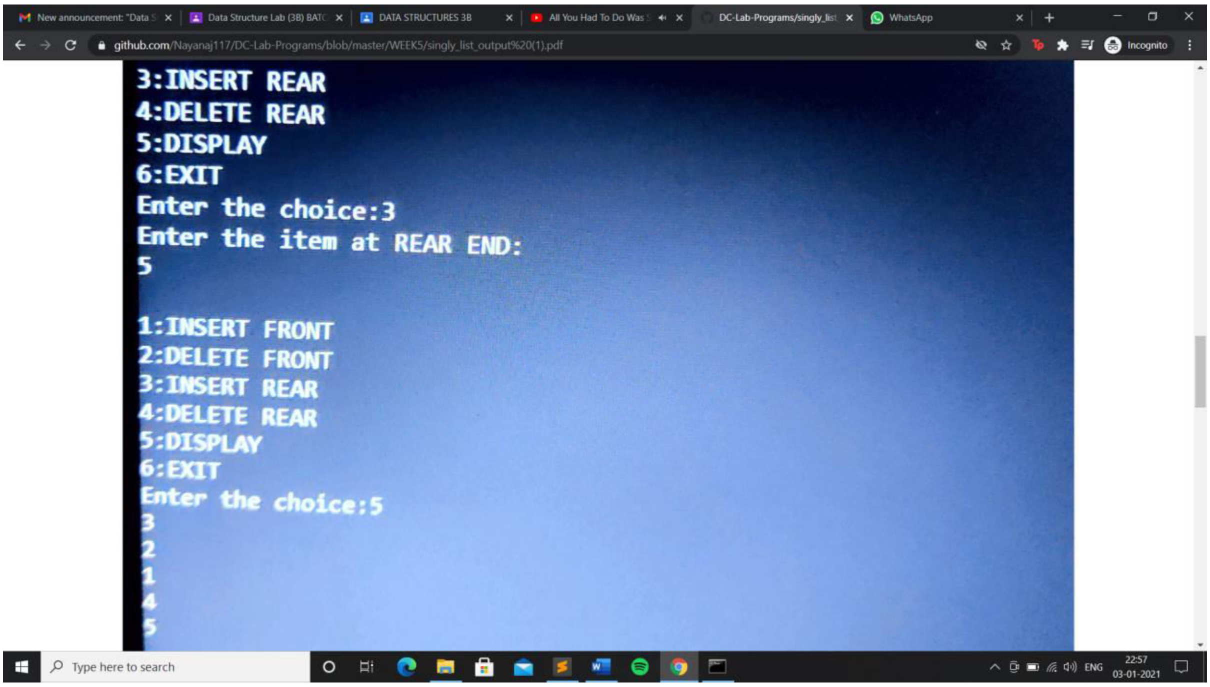
```
Enter the choice:5
3
2
1

1:INSERT FRONT
2:DELETE FRONT
3:INSERT REAR
4:DELETE REAR
5:DISPLAY
6:EXIT
Enter the choice:3
Enter the item at REAR END:
4

1:INSERT FRONT
2:DELETE FRONT
```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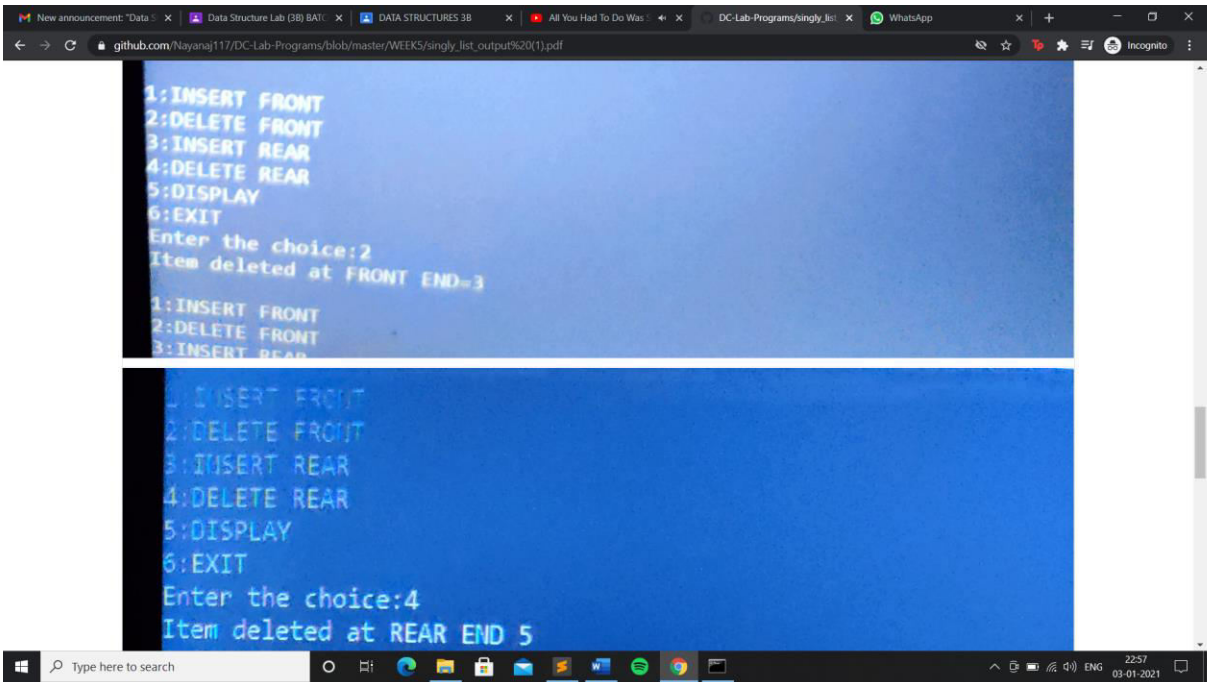
```
3:INSERT REAR
4:DELETE REAR
5:DISPLAY
6:EXIT
Enter the choice:3
Enter the item at REAR END:
5

1:INSERT FRONT
2:DELETE FRONT
3:INSERT REAR
4:DELETE REAR
5:DISPLAY
6:EXIT
Enter the choice:5
3
2
1
4
5
```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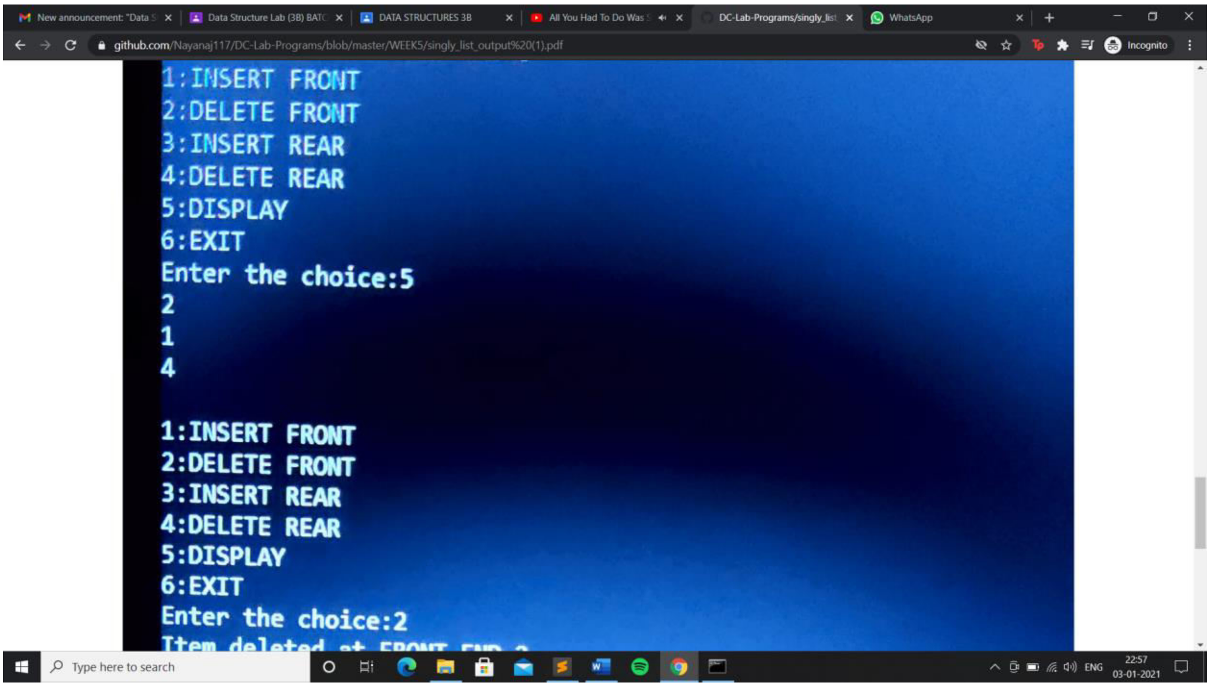
```
1:INSERT FRONT
2:DELETE FRONT
3:INSERT REAR
4:DELETE REAR
5:DISPLAY
6:EXIT
Enter the choice:2
Item deleted at FRONT END=3

1:INSERT FRONT
2:DELETE FRONT
3:INSERT REAR
```

```
1:INSERT FRONT
2:DELETE FRONT
3:INSERT REAR
4:DELETE REAR
5:DISPLAY
6:EXIT
Enter the choice:4
Item deleted at REAR END 5
```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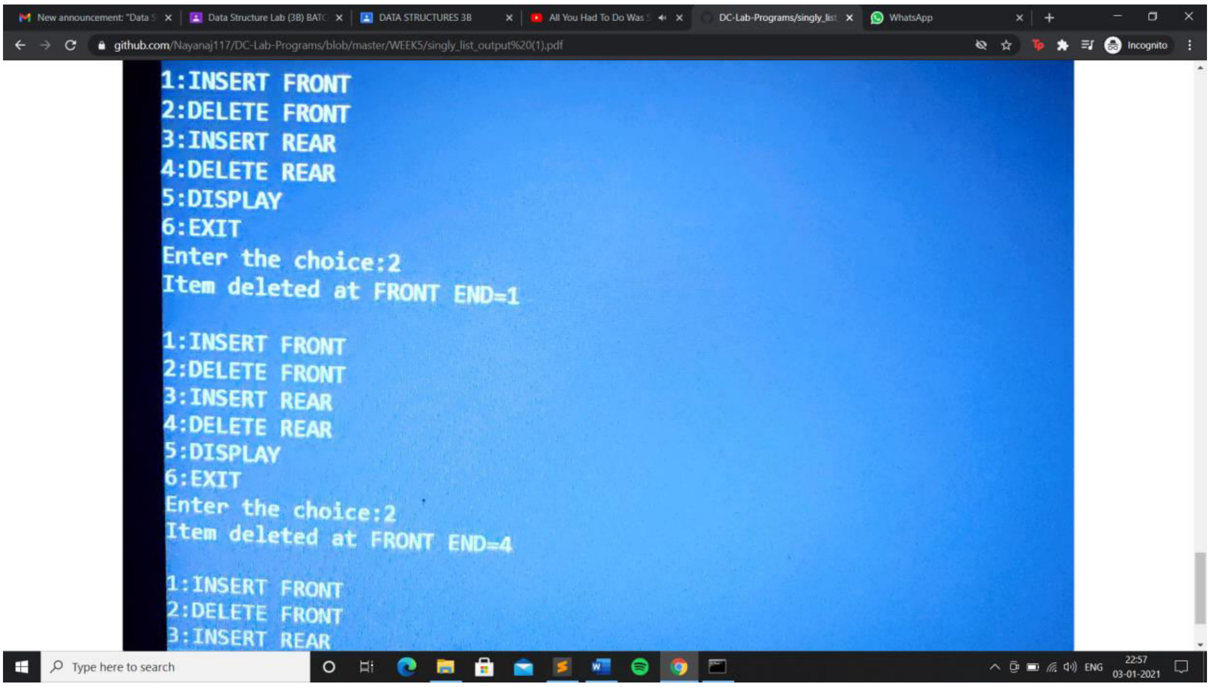
```
1:INSERT FRONT
2:DELETE FRONT
3:INSERT REAR
4:DELETE REAR
5:DISPLAY
6:EXIT
Enter the choice:5
2
1
4

1:INSERT FRONT
2:DELETE FRONT
3:INSERT REAR
4:DELETE REAR
5:DISPLAY
6:EXIT
Enter the choice:2
Item deleted at FRONT END 2
```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```
1:INSERT FRONT
2:DELETE FRONT
3:INSERT REAR
4:DELETE REAR
5:DISPLAY
6:EXIT
Enter the choice:2
Item deleted at FRONT END=1

1:INSERT FRONT
2:DELETE FRONT
3:INSERT REAR
4:DELETE REAR
5:DISPLAY
6:EXIT
Enter the choice:2
Item deleted at FRONT END=4

1:INSERT FRONT
2:DELETE FRONT
3:INSERT REAR
```