Vaidehi M Godbole
Roll no 14

Exp 4

Code:

```
#include <stdio.h>
#define MAX 10
int deque[MAX];
int left = -1, right = -1;
void input_deque(void);
void output_deque(void);
void insert_left(void);
void insert_right(void);
void delete_left(void);
void delete_right(void);
void display(void);
int main()
{
int option;
printf("\n *****MAIN MENU*****");
printf("\n 1.Input restricted dequeue");
printf("\n 2.Output restricted dequeue");
printf("Enter your option : ");
scanf("%d",&option);
switch(option)
{
case 1:
input_deque();
break;
case 2:
output_deque();
break;
}
return 0;
}
void input_deque()
{
int option;
do
```

```
{
printf("\n INPUT RESTRICTED DEQUE");
printf("\n 1.Insert at right");
printf("\n 2.Delete from left");
printf("\n 3.Delete from right");
printf("\n 4.Display");
printf("\n 5.Quit");
printf("\n Enter your option : ");
scanf("%d",&option);
switch(option)
{
case 1:
insert_right();
break;
case 2:
delete_left();
break;
case 3:
delete_right();
break;
case 4:
display();
break;
}
}while(option!=5);

}
void output_deque()
{
int option;
do
{
printf("OUTPUT RESTRICTED DEQUEUE");
printf("\n 1.Insert at right");
printf("\n 2.Insert at left");
printf("\n 3.Delete from left");
printf("\n 4.Display");
printf("\n 5.Quit");
printf("\n Enter your option : ");
scanf("%d",&option);
switch(option)
{
```

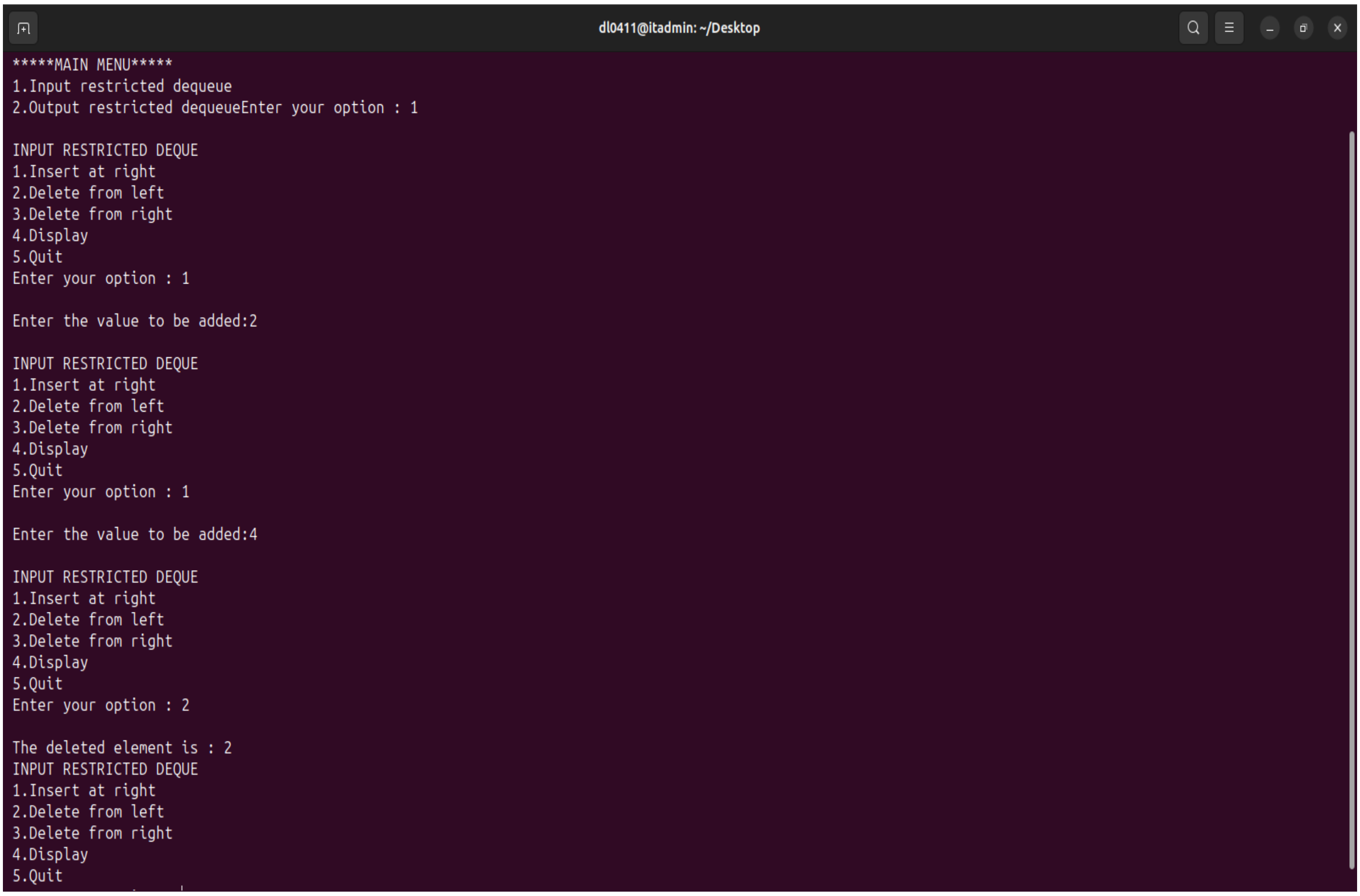
```
case 1:
insert_right();
break;
case 2:
insert_left();
break;
case 3:
delete_left();
break;
case 4:
display();
break;
}
}while(option!=5);
}
void insert_right()
{
int val;
printf("\n Enter the value to be added:");
scanf("%d", &val);
if((left == 0 && right == MAX-1) || (left == right+1))
{
printf("\n OVERFLOW");
return;
}
if (left == -1)
{
left = 0;
right = 0;
}
else
{
if(right == MAX-1)
right = 0;
else
right = right+1;
}
deque[right] = val ;
}
void insert_left()
{
int val;
```

```
printf("\n Enter the value to be added:");
scanf("%d", &val);
if((left == 0 && right == MAX-1) || (left == right+1))
{
printf("\n Overflow");
return;
}

if (left == -1)/*If queue is initially empty*/
{
left = 0;
right = 0;
}
else
{
if(left == 0)
left=MAX-1;
else
left=left-1;
}
deque[left] = val;
}
void delete_left()
{
if (left == -1)
{
printf("\n UNDERFLOW");
return ;
}
printf("\n The deleted element is : %d", deque[left]);
if(left == right)
{
left = -1;
right = -1;
}
else
{
if(left == MAX-1)
left = 0;
else
left = left+1;
}
```

```
}
void delete_right()
{
if (left == -1)
{
printf("\n UNDERFLOW");
return ;
}
printf("\n The element deleted is : %d", deque[right]);
if(left == right)
{
left = -1;
right = -1;
}
else
{
if(right == 0)
right=MAX-1;
else
right=right-1;
}
}
void display()
{
int front = left, rear = right;
if(front == -1)
{
printf("\n QUEUE IS EMPTY");
return;
}
printf(" The elements of the queue are :\t ");

if(front <= rear )
{
while(front <= rear)
{
printf("%d",deque[front]);
front++;
}
}
else
{
```

```
while(front <= MAX-1)
{
printf("%d", deque[front]);
front++;
}
front = 0;
while(front <= rear)
{
printf("%d",deque[front]);
front++;
}
}
printf("\n");
}
```

Output:



```
*****MAIN MENU*****
1.Input restricted dequeue
2.Output restricted dequeueEnter your option : 1

INPUT RESTRICTED DEQUE
1.Insert at right
2.Delete from left
3.Delete from right
4.Display
5.Quit
Enter your option : 1

Enter the value to be added:2

INPUT RESTRICTED DEQUE
1.Insert at right
2.Delete from left
3.Delete from right
4.Display
5.Quit
Enter your option : 1

Enter the value to be added:4

INPUT RESTRICTED DEQUE
1.Insert at right
2.Delete from left
3.Delete from right
4.Display
5.Quit
Enter your option : 2

The deleted element is : 2
INPUT RESTRICTED DEQUE
1.Insert at right
2.Delete from left
3.Delete from right
4.Display
5.Quit
```