

## EXPERIMENT NO.4

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Roll No. : 18

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#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 deque");
    printf("\n 2.Output restricted deque");
    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
    {
```

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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 DEQUE");
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:

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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:");

```

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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(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("\n The elements of the queue are : ");

    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:

```

ltl4@22DL407:~$ gcc amogh18.c
ltl4@22DL407:~$ ./a.out

*****MAIN MENU*****
1.Input restricted deque
2.Output restricted dequeEnter 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:5

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

The element deleted is : 5
INPUT RESTRICTED DEQUE
1.Insert at right
2.Delete from left
3.Delete from right
4.Display
5.Quit
Enter your option : 5
ltl4@22DL407:~$ gcc amogh18.c
ltl4@22DL407:~$ ./a.out

*****MAIN MENU*****
1.Input restricted deque
2.Output restricted dequeEnter your option : 2

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

4.Display
5.Quit
Enter your option : 5
ltl4@22DL407:~$

```