Meet patel – SYIT – 43 , experiment no. 4:

```c
#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("\n 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:
```

```c
            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:
            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);
```

```c
    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){
        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{
```

```c
        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");
}
```

```
dl0409@noname:~$ gedit meet4.c
dl0409@noname:~$ gcc meet4.c
dl0409@noname:~$ ./a.out

*****MAIN MENU*****
1.Input restricted deque
2.Output restricted deque
Enter 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: 23

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

The elements of the queue are: 23

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: 67

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

```
Enter your option : 1

Enter the value to be added: 67

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: 99

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

The elements of the queue are: 23 67 99

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: 23
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: 99
INPUT RESTRICTED DEQUE
1.Insert at right
2.Delete from left
3.Delete from right
```

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

The elements of the queue are: 23 67 99

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: 23
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: 99
INPUT RESTRICTED DEQUE
1.Insert at right
2.Delete from left
3.Delete from right
4.Display
5.Quit
Enter your option : 4

The elements of the queue are: 67

INPUT RESTRICTED DEQUE
1.Insert at right
2.Delete from left
3.Delete from right
4.Display
5.Quit
Enter your option : 5
dl0409@noname:~$
```