EXPERIMENT 4

Name: Siddhesh Vinay Rane
Class: SY-IT
Roll no: 47

Program:

```
#include <stdio.h>
#define MAX 10
int deque[MAX];
int front=-1,rear=-1;
void input_deque(void);
void output_deque(void);
void insert_right(void);
void insert_left(void);
void delete_right(void);
void delete_left(void);
void display(void);
int main()
{ int choice;
  printf("Menu\n1.Input Restricted Deque\t2.Output Restricted Deque");
  printf("\nEnter your choice:");
  scanf("%d",&choice);
  switch(choice)
   { case 1: input_deque();
             break;
     case 2: output_deque();
                break;
   }
                    return 0;
}
void input_deque()
{ int choice;
  do
   { printf("\n INPUT RESTRICTED DEQUE");
     printf("\n 1.Insert at right\n2.Delete from left\n3.Delete from right\n4.Display\n5.Quit");
     printf("\n Enter your choice: ");
     scanf("%d",&choice);
     switch(choice)
      { case 1: insert_right();
                break;
           case 2: delete_left();
                break;
           case 3: delete_right();
                break;
           case 4: display();
                break;
      }
   }while(choice!=5);
}
void output_deque()
{ int choice;
  do
   { printf("OUTPUT RESTRICTED DEQUE");
     printf("\n1.Insert at right\n2.Insert at left\n3.Delete from left\n4.Display\n5.Quit");
     printf("\n Enter your option: ");
```

```
    scanf("%d",&choice);
    switch(choice)
     { case 1: insert_right();
              break;
          case 2: insert_left();
                  break;
          case 3: delete_left();
                  break;
          case 4: display();
                  break;
     }
  }while(choice!=5);
}
void insert_right()
{ int val;
  printf("\nEnter the value to be added:");
  scanf("%d",&val);
  if((front==0 && rear==MAX-1) || (front==rear+1))
   { printf("\nOVERFLOW");
     return;
   }
  if (front==-1)
   { front=0;
     rear=0;
   }
  else { if(rear==MAX-1)
           rear=0;
           else
           rear=rear+1;
       }
       deque[rear]=val;
}
void insert_left()
{ int val;
  printf("\nEnter the value to be added:");
  scanf("%d",&val);
  if((front==0 && rear==MAX-1) || (front==rear+1))
   { printf("\nOverflow");
     return;
   }
  if (front==-1)
   { front=0;
     rear=0;
   }
  else { if(front==0)
           front=MAX-1;
           else
           front=front-1;
       }
       deque[front] = val;
}
void delete_left()
          {
          if (front==-1)
          {
          printf("\nUNDERFLOW");
          return ;
```

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

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

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

Output: