Tushar Monga - 35214803119

EXPERIMENT 5

Question 1 : Program to perform insertion, deletion, peek and display operations on a Circular Queue made using an 1D array.

```
#include<stdio.h>
#define N 5

int que[N],front=-1;rear=-1;

void insert(int ele)
{
   if(front==-1)
   {
      rear=front=0;
   }
   else
   {
      if(rear==N-1)
         rear=0;
      else
         rear++;
   }
   que[rear]=ele;
}
```

```
int deque()
{
   int rele=que[front];
   if(front==rear)
   {
      front=-1;
      rear=-1;
   }
   else
   {
      if(front==N-1)
         front=0;
      else
         front++;
   }
   return rele;
}

int peek()
{
   return que[front];
}

void display()
{
   int i=front;
   while(i!=(rear+1))
```

```
    {
        printf("%d ",que[i]);
        i++;
        if(rear!=N-1)
            i=i%N;
    }
}

void main()
{
    int ch,ele;
    do
    {
        printf("\n\n1. Insert an element");
        printf("\n2. Remove an element");
        printf("\n3. Peek");
        printf("\n4. Display Queue");
        printf("\n5. Exit");
        printf("\n\n Choice : ");

        scanf("%d",&ch);

        switch(ch)
        {
            case 1 : if((front==0 && rear==N-1) || (front==rear+1))
                        printf("\nOverflow\n");
                    else
                    {
```

```
            printf("\nEnter the element : ");
            scanf("%d",&ele);
            insert(ele);
        }
        break;

case 2 : if(front==-1)
            printf("\nUnderflow\n");
        else
        {
            ele=deque();
            printf("\nRemove element : %d\n",ele);
        }
        break;

case 3 : if(front==-1)
            printf("\nUnderflow\n");
        else
        {
            printf("\nElement : %d\n",peek());
        }
        break;

case 4 : if(front==-1)
            printf("\nUnderflow\n");
        else
        {
            display();
```

```
            printf("\n\n");
        }
        break;

    default : printf("\n\nInvalid Choice\n\n");
  }
 }while(ch!=5);
}
```

OUTPUT

```
1. Insert an element
2. Remove an element
3. Peek
4. Display Queue
5. Exit

 Choice : 1

Enter the element : 77


1. Insert an element
2. Remove an element
3. Peek
4. Display Queue
5. Exit

 Choice : 1

Enter the element : 20


1. Insert an element
2. Remove an element
3. Peek
4. Display Queue
5. Exit

 Choice : 2

Remove element : 77
```

```
1. Insert an element
2. Remove an element
3. Peek
4. Display Queue
5. Exit

 Choice : 1

Enter the element : 14


1. Insert an element
2. Remove an element
3. Peek
4. Display Queue
5. Exit

 Choice : 3

Element : 20


1. Insert an element
2. Remove an element
3. Peek
4. Display Queue
5. Exit

 Choice : 4
20 14
```

Tushar Monga - 35214803119

Question 2 : Program to perform insertion, deletion, peek and display operations on a Linear Queue made using an 1D array.

```
#include<stdio.h>
#define N 100

int que[N],front=-1;rear=-1;

void insert(int ele)
{
   if(front==-1)
   {
      rear=front=0;
      que[rear]=ele;
   }
   else
   {
      rear++;
      que[rear]=ele;
   }
}

int delettion()
{
   int rele=que[front];
   front++;
   return rele;
}

int peek()
{
   return que[front];
}
```

```
void display()
{
   int i=front;
   while(i!=rear+1)
   {
      printf("%d ",que[i]);
      i++;
   }
}

void main()
{
   int ch,ele;
   do
   {
      printf("\n\n1. Insert an element");
      printf("\n2. Remove an element");
      printf("\n3. Peek");
      printf("\n4. Display Queue");
      printf("\n5. Exit");
      printf("\n\n Choice : ");

      scanf("%d",&ch);

      switch(ch)
      {
         case 1 : if(rear==N-1)
                     printf("\nOverflow\n");
                  else
                  {
                     printf("\nEnter the element : ");
                     scanf("%d",&ele);
                     insert(ele);
                  }
                  break;
```

```
        case 2 : if(front==-1 || front==rear+1)
                    printf("\nUnderflow\n");
                 else
                 {
                    ele=delettion();
                    printf("\nRemove element : %d\n",ele);
                 }
                 break;

        case 3 : if(front==-1)
                    printf("\nUnderflow\n");
                 else
                 {
                    printf("\nElement : %d\n",peek());
                 }
                 break;

        case 4 : if(front==-1)
                    printf("\nUnderflow\n");
                 else
                 {
                    display();
                    printf("\n\n");
                 }
                 break;
        default : printf("\n\nInvalid Choice\n\n");
      }
   }while(ch!=5);
}
```

OUTPUT

```
1. Insert an element
2. Remove an element
3. Peek
4. Display Queue
5. Exit

 Choice : 1

Enter the element : 7


1. Insert an element
2. Remove an element
3. Peek
4. Display Queue
5. Exit

 Choice : 1

Enter the element : 77


1. Insert an element
2. Remove an element
3. Peek
4. Display Queue
5. Exit

 Choice : 1

Enter the element : 14
```

```
1. Insert an element
2. Remove an element
3. Peek
4. Display Queue
5. Exit

 Choice : 2

Remove element : 7


1. Insert an element
2. Remove an element
3. Peek
4. Display Queue
5. Exit

 Choice : 3

Element : 77


1. Insert an element
2. Remove an element
3. Peek
4. Display Queue
5. Exit

 Choice : 1

Enter the element : 74
```