**Program:**

#include<stdio.h>

#include<math.h>

#define Max 5

int queue[Max];

int front=-1;

int rear=-1;

void enqueue(int x)

{

if(rear==Max-1)

printf("Overflow \n");

else if (front==-1 && rear==-1)

front=rear=0;

else

rear++;

queue[rear]=x;

}

void dequeue()

{

int x;

if(front==-1 && rear==-1)

printf("Underflow \n");

else if (front==rear)

front=rear=-1;

else

{ printf("Deleted %d from the Queue \n",queue[front]);

front++;

}

}

void getFront()

{

if((front==-1 && rear==-1) || (front > rear) )

{

printf("Queue is empty \n");

}

else

printf("The element in front is %d \n",(queue[front]));

}

void getRear()

{

if((front==-1 && rear==-1) || (front > rear) )

{

printf("Queue is empty \n");

}

else

printf("The element in rear is %d \n ",(queue[rear]));

}

void size()

{

int i,count=0;

if((front==-1 && rear==-1) || (front > rear) )

printf("Queue is empty \n");

else

{

for(i=front;i<=rear;i++)

count++;

printf("\n There are %d elements \n",count);

}

}

void isEmpty()

{

if((front==-1 && rear==-1) || (front > rear) )

printf("Queue is Empty \n");

else

printf("Queue is Not Empty \n");

}

void isFull()

{

if(rear==Max-1)

printf("Queue is Full \n");

else

printf("Queue is Not Full \n");

}

void display()

{

int i;

if((front==-1 && rear==-1) || (front > rear) )

printf("Queue is empty \n");

else

{

for(i=front;i<=rear;i++)

printf("\t %d ",queue[i]);

printf("\n");

}

}

int main()

{

int choice,ans;

printf("1 To insert an element \n");

printf("2 To delete an element \n");

printf("3 To check element in front \n");

printf("4 To check element in rear \n");

printf("5 To check if Queue is full \n");

printf("6 To check if Queue is empty \n");

printf("7 To count number of elements \n");

printf("8 To Display the queue \n");

do

{

printf("Enter your choice \n");

scanf("%d",&choice);

switch (choice)

{

case 1:

int num,x;

do

{

printf("Enter number to be inserted \n");

scanf("%d",&num);

enqueue(num);

printf("Press 1 to add more numbers \n");

scanf("%d",&x);

}while(x==1);

break;

case 2:

dequeue();

break;

case 3:

getFront();

break;

case 4:

getRear();

break;

case 5:

isFull();

break;

case 6:

isEmpty();

break;

case 7:

size();

break;

case 8:

display();

break;

default:

printf("Invalid Choice \n ");

break;

}

printf("Press 1 to choose another option \n");

scanf("%d",&ans);

}while (ans==1);

return 0;

}

**Output:**

1 To insert an element

2 To delete an element

3 To check element in front

4 To check element in rear

5 To check if Queue is full

6 To check if Queue is empty

7 To count number of elements

8 To Display the queue

Enter your choice

1

Enter number to be inserted

5

Press 1 to add more numbers

1

Enter number to be inserted

6

Press 1 to add more numbers

1

Enter number to be inserted

7

Press 1 to add more numbers

0

Press 1 to choose another option

1

Enter your choice

2

Deleted 5 from the Queue

Press 1 to choose another option

1

Enter your choice

3

The element in front is 6

Press 1 to choose another option

1

Enter your choice

4

The element in rear is 7

Press 1 to choose another option

1

Enter your choice

5

Queue is Not Full

Press 1 to choose another option

1

Enter your choice

6

Queue is Not Empty

Press 1 to choose another option

1

Enter your choice

7

There are 2 elements

Press 1 to choose another option

1

Enter your choice

8

6 7

Press 1 to choose another option

0