```
#include <stdio.h>
#include <stdlib.h>
#define max 3

int queue[max];
int front=-1, rear=-1;

void insert(int x){
    if(front==(rear+1)%max){
        printf("overflow!\n");
    }
    else if(front==-1 && rear==-1){
        front=rear=0
        queue[rear]=x;
    }
    else{
        rear=(rear+1)%Max;
        queue[rear]=x;
    }
}

Void delete(){
    if(front==-1 && rear==-1){
        printf("Underflow!\n");
    }
    else if(front==rear){
        printf("Deleted %d queue\n", queue[front]);
        front=rear=-1;
    }
    else{
        printf("Deleted %d from the queue.\n",
            queue[front]);
        front=(front+1)%max; } }
```

```
Void display ()
{
  if (front == -1)
  {
    printf ("Queue is empty \n");
    return;
  }

  printf ("Queue elements are: \n");
  int i = front;
  while (1)
  {
    printf ("%d \n", queue[i]);
    if (i == rear)
      break;
    i = (i+1) % max;
  }
}

int main ()
{
  int choice, item;
  while (1)
  {
    printf ("\n Enter your choice: \n");
    printf ("1. Insert 2. Delete 3. Display
             4. Exit");
    scanf ("%d", &choice);

    switch (choice)
    {
      case 1:
        printf ("Enter the item to insert:");
        scanf ("%d", &item);
        insert (item);
        break;
      case 2:
        delete ();
        break;
```

```
case 3:
    display();
    break;
case 4:
    exit(0);
default:
    printf("Invalid input");
}
}
}
```

Output:

1. Insert 2. Delete 3. Display 4. Exit

1

Enter the item to insert: 23

Enter your choice
1. Insert 2. Delete 3. Display 4. Exit

2

Deleted 23

Enter your choice

3

Queue is empty

Enter your choice:
1. insert 2. Delete 3. Display 4. Exit

4

C third_lab_program.c

C third_lab_program.c > enque()

```c
#include <stdio.h>
#include <stdlib.h>

#define max 3

int queue[max];
int front = -1, rear = -1;

void enque() {
    int item;
    if (rear == max - 1) {   // corrected N → max
        printf("Overflow! Cannot insert the element\n");
        return;
    }

    printf("Enter the item to insert: ");
    scanf("%d", &item);

    if (front == -1)
        front = 0;

    rear++;
    queue[rear] = item;

    printf("Inserted %d into the queue", item);
}

void deque() {
    if (front == -1 || front > rear) {
        printf("Underflow! Empty queue, cannot delete\n");
        return;
    }

    printf("Deleted %d from the queue", queue[front]);
    front++;

    if (front > rear)
        front = rear = -1;
}

void display() {
    if (front == -1) {
        printf("Empty queue! Nothing to display\n");
        return;   // missing earlier
    }

    printf("The queue elements are: ");
    for (int i = front; i <= rear; i++)
        printf("%d ", queue[i]);
}

int main() {
    int choice, item;

    while (1) {
        printf("1.insert 2.delete 3.display 4.exit");
        printf("\nEnter your choice: ");
        scanf("%d", &choice);

        switch (choice) {
            case 1:
            printf("Enter the item to insert:");
            scanf("%d", &item);
            enque(item);
            break;
            case 2: deque(); break;
            case 3: display(); break;
            case 4: exit(0);
            default: printf("Invalid input! Try again");
        }
        printf("\n");
    }
}
```

```
C third_lab_program.c > enque()
 9   void enque() {
21
22       rear++;
23       queue[rear] = item;
```

PROBLEMS OUTPUT TERMINAL PORTS

```
PS C:\Users\sudhi\.vscode\C> cd "c:\Users\sudhi\.
1.insert 2.delete 3.display 4.exit
Enter your choice: 1
Enter the item to insert:23
Enter the item to insert: 20
Inserted 20 into the queue
1.insert 2.delete 3.display 4.exit
Enter your choice: 2
Deleted 20 from the queue
1.insert 2.delete 3.display 4.exit
Enter your choice: 3
Empty queue! Nothing to display

1.insert 2.delete 3.display 4.exit
Empty queue! Nothing to display

1.insert 2.delete 3.display 4.exit

1.insert 2.delete 3.display 4.exit
1.insert 2.delete 3.display 4.exit
Enter your choice: 3
Enter your choice: 3
Empty queue! Nothing to display

Empty queue! Nothing to display

1.insert 2.delete 3.display 4.exit

1.insert 2.delete 3.display 4.exit
1.insert 2.delete 3.display 4.exit
Enter your choice: 4
PS C:\Users\sudhi\.vscode\C>
```