

```
40 int main() {
41     int ch;
42     while(1) {
43         printf("\nselect operation on queue to perform\n");
44         printf("1.Insertion\t2.Deletion\t3.Display\t4.Exit\n");
45         scanf("%d", &ch);
46         switch(ch) {
47             case 1:
48                 printf("\nEnter an element to be inserted:");
49                 int x;
50                 scanf("%d", &x);
51                 enqueue(x);
52                 break;
53             case 2:
54                 dequeue();
55                 break;
56             case 3:
57                 display();
58                 break;
59             case 4:
60                 exit(0);
61             default:
62                 printf("Invalid choice\n");
63                 break;
64         }
65     }
66     return 0;
67 }
```

```
1 #include<stdio.h>
2 #include<stdlib.h>
3 #define N 5
4 int queue[N];
5 int front=-1,rear=-1;
6 void enqueue(int x){
7     if( rear== -1 && front== -1){
8         front=rear=0;
9         queue[rear]=x;
10        printf("%d is inserted into queue\n",x);
11    }
12    else if(rear==N-1){
13        printf("Queue overflow\n");
14    }
15    else{
16        queue[++rear]=x;
17        printf("%d is inserted into queue\n",x);
18    }
19 }
20 void dequeue(){
21     if (front== -1 || front>rear){
22         printf("Queue underflow\n");
23     }
24     else{
25         printf("%d is deleted from queue\n",queue[front++]);
26     }
27 }
28 void display(){
29     if (front== -1 || front>rear){
30         printf("Queue underflow\n");
31     }
32     else{
33         printf("Elements in the queue are\n");
34         for(int i=front;i<=rear;i++){
35             printf("%d\t",queue[i]);
36         }
37         printf("\n");
38     }
}
```

```
select operation on queue to perform  
1.Insertion    2.Deletion    3.Display    4.Exit  
1
```

```
Enter an element to be inserted:10  
10 is inserted into queue
```

```
select operation on queue to perform  
1.Insertion    2.Deletion    3.Display    4.Exit  
2  
10 is deleted from queue
```

```
select operation on queue to perform  
1.Insertion    2.Deletion    3.Display    4.Exit  
2  
Queue underflow
```

```
select operation on queue to perform  
1.Insertion    2.Deletion    3.Display    4.Exit  
1
```

```
Enter an element to be inserted:106  
106 is inserted into queue
```

```
select operation on queue to perform  
1.Insertion    2.Deletion    3.Display    4.Exit  
1
```

```
Enter an element to be inserted:978  
978 is inserted into queue
```

```
select operation on queue to perform  
1.Insertion    2.Deletion    3.Display    4.Exit  
1
```

```
Enter an element to be inserted:32  
32 is inserted into queue
```

```
select operation on queue to perform  
1.Insertion    2.Deletion    3.Display    4.Exit  
3  
Elements in the queue are  
106    978    32
```

```
select operation on queue to perform  
1.Insertion    2.Deletion    3.Display    4.Exit  
4
```

```
Process returned 0 (0x0)  execution time : 29.574 s  
Press any key to continue.
```

Q. Write a program to stimulate the working of a queue of integers using an array. Provide the following operations:  
Insert, Delete, Display. The program should print appropriate messages for queue empty and queue overflow conditions.

#### Algorithm:-

- Step 1: start
- Step 2: Define an array queue with fixed size MAX
- Step 3: Set two variables FRONT=-1 & REAR=-1 to initialize an empty array queue
- Step 4: ENQUEUE
  - if REAR=MAX-1, print overflow
  - else if (FRONT== -1 & REAR == -1), set FRONT=REAR=0.
  - Insert into queue, queue[REAR]=x;
  - else;
- Step 5: dequeue
  - if (front > rear) , print underflow
  - else if (front < rear)
  - i++  
queue[i] = queue[front];  
front++;
- Step 6: display
  - If (front == -1 & rear == -1) print underflow
  - else
    - iterate from i=front to rear using for loop
    - and print each element

MQ

#### Code:-

```
#include < stdio.h>
#include < stdlib.h>
#define N 5
int queue[N];
int front=-1, rear=-1;

void enqueue(int x) {
    if (rear == -1 && front == -1) {
        front = rear = 0;
        queue[rear] = x;
        printf("x.d is inserted into queue\n", x);
    } else if (rear == N-1) & print("overflow");
    else {
        queue[++rear] = x;
        printf("x.d is deleted from queue in", queue[front++]);
    }
}
```

#### void dequeue()

```
if (front == -1 | front > rear) {
    printf("Queue Underflow\n");
} else {
    printf("x.d is deleted from queue in", queue[front++]);
}
```

#### void display()

```
if (front == -1 | front > rear) {
    printf("Queue Underflow\n");
} else {
    printf("Elements in the queue are\n");
    for (int i=front; i<=rear; i++) {
        printf("y.d", queue[i]);
    }
    printf("\n");
}
```

```

int main()
{
    int ch;
    while(1)
    {
        printf("In select operation on queue to perform ln");
        printf("1.Insertion 2.Deletion 3.Display 4.Exit(n");
        scanf("%d", &ch);
        switch(ch)
        {
            case 1:
                printf("In enter an element to be inserted : ");
                int x;
                scanf("%d", &x);
                enqueue(x);
                break;
            case 2:
                dequeue();
                break;
            case 3:
                display();
                break;
            case 4:
                exit(0);
                break;
            default:
                printf("Invalid choice ln");
                break;
        }
    }
    return 0;
}

```

O/p:-

Select operation on queue to perform  
 1.Insertion 2.Deletion 3.Display 4.Exit

1

Enter an Element to be Inserted : 978  
 978 is inserted into queue.

Select operation on queue to perform  
 1.Insertion 2.Deletion 3.Display 4.Exit  
 978 is deleted from queue

Select operation on queue to perform  
 1.Insertion 2.Deletion 3.Display 4.Exit

2 Queue under flow

Select operation on queue to perform  
 1.Insertion 2.Deletion 3.Display 4.Exit

Enter an element to be inserted : 21  
 21 is inserted into queue

Select operation on queue to perform  
 1.Insertion 2.Deletion 3.Display 4.Exit

Enter an element to be inserted : 324  
 324 is inserted into queue

Select operation on queue to perform  
 1.Insertion 2.Deletion 3.Display 4.Exit

Enter an element to be inserted : 106  
 106 is inserted into queue

Select operation on queue to perform  
 1.Insertion 2.Deletion 3.Display 4.Exit

Elements in the queue are

21 324 106 My  
 13/10/25.