

```
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 simulate 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:-

Steps:- start

Step 1:- Define an array queue with fixed size MAX

Step 2:- Set two variables FRONT $\leftarrow -1$ & REAR $\leftarrow -1$ 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: queue[++REAR] = x;

Step 5:- Dequeue

→ if (FRONT == REAR & FRONT == -1), print underflow
→ else { queue[FRONT] = 0;
FRONT++;

Step 6:- Display

→ if (FRONT == -1 & REAR == -1) print underflow,
else

Iterate from FRONT to REAR using for loop
and print Each Element

M9

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 & front != -1) {
        printf("overflow\n");
    }
    else {
        queue[++rear] = x;
        printf("x.d is deleted from queue\n", queue[front++]);
    }
}
```

void dequeue() {

if (front == -1 | front > rear) {
printf("Queue Underflow\n");
}

else {

printf("x.d is deleted from queue\n", 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\t", queue[i]);
}

printf("\n");
}

}


```

int main() {
    int ch;
    while(1) {
        printf("In select operation on queue to perform\n");
        printf("1.Insertion 2.Deletion 3.Display 4.Exit\n");
        scanf("%d", &ch);
        switch(ch) {
            case 1:
                printf("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);
            default:
                printf("Invalid choice\n");
                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
2
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
1

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
1

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
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
3

Elements in the queue are
21 324 106

M4
13/10/25.