

2. Write a program to simulate the working of a circular queue using an array. Provide the following operations: insert, delete, display. The program should print appropriate message for queue empty and queue overflow conditions.

⇒

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

```
#define SIZE 5
```

```
int item[SIZE];
```

```
int front = -1, rear = -1;
```

```
int isfull() {
```

```
    if ((front == rear + 1) || (front == 0 &&  
        rear == SIZE - 1))
```

```
        return 1;
```

```
    return 0;
```

```
}
```

```
int isEmpty() {
```

```
    if (front == -1)
```

```
        return 1;
```

```
    return 0;
```

```
}
```

```
void enqueue (int element) {  
    if (isfull())  
        printf("\n Queue is full ! \n");  
    else {  
        if (front == -1)  
            front = 0;  
        rear = (rear + 1) % SIZE;  
        item[rear] = element;  
        printf("\n Inserted %d", element);  
    }  
}
```

```
void dequeue () {  
    int element;  
    if (isEmpty()) {  
        printf("\n queue is empty \n");  
        return (-1);  
    } else {  
        element = item[front];  
        if (front == rear) {  
            front = -1;  
            rear = -1;  
        }  
        else  
            front = (front + 1) % SIZE;  
        printf("\n Deleted element %d",  
            element);  
    }  
}
```



```

void display() {
    int i;
    if (is Empty())
        printf("\n Empty queue");
    else {
        printf("\n front position = %d\n",
            front);
        for (i = front; i != rear; i = (i+1) %
            size)
            printf("%d\n", item[i]);
        printf("%d", item[i]);
    }
}

```

```

void main() {
    int choice, element;
    while (1)
    {
        printf("1. Enqueue\n 2. Dequeue\n
            3. Display\n 4. Exit");
        printf("Enter a choice for user");
        scanf("%d", &choice);
        switch (choice)
        {

```

Case 1:

```

        printf("Enter element");
        scanf("%d", &element);
        enqueue(element)

```

case 2 :

element = dequeue()

break ;

case 3 :

display ()

break ;

case 4 :

exit (0) ;

}

}

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Enter the operation:

1.enqueue
2.dequeue
3.display
4.-1 to stop

1

Enter the number:

7

successfully enqueued

Enter the operation:

1.enqueue
2.dequeue
3.display
4.-1 to stop

1

Enter the number:

8

successful enqueued

Enter the operation:

1.enqueue
2.dequeue
3.display
4.-1 to stop

1

Enter the number:

9

successful enqueued

Enter the operation:

1.enqueue
2.dequeue
3.display
4.-1 to stop

1

Enter the number:

0

queue overflow

Enter the operation:

1.enqueue
2.dequeue
3.display
4.-1 to stop

3

Elements are:

7

8

9