

## Experiment No.: 11

**AIM:-** Implement C++ program for queue

**TITLE:-** Queues are frequently used in computer programming, and a typical example is the creation of a job queue by an operating system. If the operating system does not use priorities, then the jobs are processed in the order they enter the system. Write C++ program for simulating job queue. Write functions to add job and delete job from queue.

**OBJECTIVES:-**

To learn basic concepts of queue.

**THEORY:-**

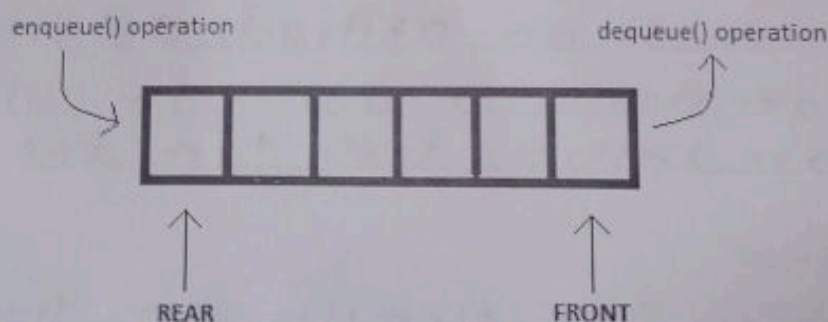
**Queue Data Structure**

Queue is also an abstract data type or a linear data structure, just like stack data structure, in which the first element is inserted from one end called the REAR(also called tail), and the removal of existing element takes place from the other end called as FRONT(also called head).

This makes queue as FIFO(First in First Out) data structure, which means that element inserted first will be removed first.

This is exactly how queue system works in real world. If you go to a ticket counter to buy movie tickets, and are first in the queue, then you will be the first one to get the tickets. Same is the case with Queue data structure. Data inserted first, will leave the queue first.

The process to add an element into queue is called **Enqueue** and the process of removal of an element from queue is called **Dequeue**.



**enqueue()** is the operation for adding an element into Queue.

**dequeue()** is the operation for removing an element from Queue.

**QUEUE DATA STRUCTURE**

**Implementation:**

There are two ways to implement a queue:

- Using array
- Using linked list

**Algorithm for ENQUEUE operation**

1. Check if the queue is full or not.
2. If the queue is full, then prints overflow error and exit the program.
3. If the queue is not full, then increment the tail and add the element.

**Algorithm for DEQUEUE operation**

1. Check if the queue is empty or not.
  2. If the queue is empty, then print underflow error and exit the program.
- If the queue is not empty, then print the element at the head and increment the head.

**CONCLUSION:-**

In this experiment, we learn about  
the concepts & operations of deque.  
queue.

**QUESTIONS:-**

1. What is queue?

In computer science there is double  
ended queue is an abstract datatype  
that generalize a queue for which  
elements are inserted from both end.

2. What is front and rear?

Rear: Where the elements are inserted.  
front: Where the elements are removed,  
or deleted.



3. Explain various operations which can be performed on queue?

The basic queue operations are insertion & deletion. Insertion is done at the rear end of the queue & deletion is done at the front of the queue.

4. How to represent a queue?

We can represent queue with linear array or with linked list where insertion happens at rear & deletion at front.

5. What are real time applications of queue?

- Serving customer requests at hotel.
- Handling single requests to CPU
- Carriage line in any store.

Staff Signature & Date