**LABWORK 3:**

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**INTRODUCTION:**

In this lab work, we have implemented queue data structure using array and linked list. We have done following operations.

(a) enqueue(element): Adds an element into the queue

(b) dequeue(): Removes an element from the queue

(c) isEmpty(): Checks if the queue is empty

(d) isFull(): Checks if the queue is full

(e) front(): Gives the element at the front

(f) back(): Gives the element at the rear

**IMPLEMENTATION**:

Using array and linked list data structures, we have implemented the above operations.

In array, we have implemented circular queue,

* We have checked whether the array is completely filled or not for isFull() operation.
* We have checked if array is empty for isEmpty() operation.
* We have added element to next empty index of array for enqueue(element) operation.
* We have removed first added element in array dequeue() operation.

In linked list,

* We have added new node to Tail of linkedlist for enqueue(element) operation.
* We have removed from head of linked list for dequeue() operation.
* We have returned Head element of linked list for front() operation.
* We have returned tail element of linked list for back() operation.
* We have checked if HEAD pointer is null or not, for isEmpty() operation.
* We have checked if there are declared number of nodes in the linked list or not, for isFull() operation.

**OUTPUT:**

Below inserted are the screenshots of output of the program.



