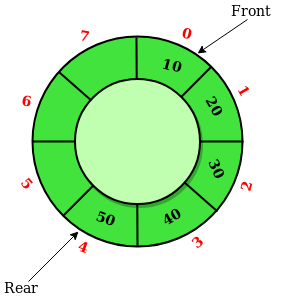
Round 0

| **Discipline** | **COMPUTER SCIENCE AND ENGINEERING** |
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| **Lab** | **Data Structure Lab (KCS351)** |
| **Experiment** | **1.** Implementation of Circular Queue using Linked List |

**About the Lab(objective):** The course is designed to develop skills to design and analyze simple linear and non linear data structures. It strengthen the ability to the students to identify and apply the suitable data structure for the given real world problem. It enables them to gain knowledge in practical applications of data structures.

Type here:

Circular Queue is a linear data structure in which the operations are performed based on FIFO (First In First Out) principle and the last position is connected back to the first position to make a circle. It is also called **‘Ring Buffer’**. 

In a normal Queue, we can insert elements until queue becomes full. But once queue becomes full, we can not insert the next element even if there is a space in front of queue.

Operations on Circular Queue:

* **Front:** Get the front item from queue.
* **Rear:** Get the last item from queue.
* **enQueue(value)**This function is used to insert an element into the circular queue. In a circular queue, the new element is always inserted at Rear position.

**Steps:**

* 1. Check whether queue is Full – Check ((rear == SIZE-1 && front == 0) || (rear == front-1)).
  2. If it is full then display Queue is full. If queue is not full then, check if (rear == SIZE – 1 && front != 0) if it is true then set rear=0 and insert element.
* **deQueue()** This function is used to delete an element from the circular queue. In a circular queue, the element is always deleted from front position.

**Steps:**

* 1. Check whether queue is Empty means check (front==-1).
  2. If it is empty then display Queue is empty. If queue is not empty then step 3
  3. Check if (front==rear) if it is true then set front=rear= -1 else check if (front==size-1), if it is true then set front=0 and return the element.

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**Applications:**

1. **Memory Management:** The unused memory locations in the case of ordinary queues can be utilized in circular queues.
2. **Traffic system:** In computer controlled traffic system, circular queues are used to switch on the traffic lights one by one repeatedly as per the time set.
3. **CPU Scheduling:** Operating systems often maintain a queue of processes that are ready to execute or that are waiting for a particular event to occur.

**Target Audience:** B.Tech Students CSE/IT SECOND YEAR

**Course Alignment:** B.Tech CSE/IT

**Universities Mapped:** Dr. A.P.J Abdul Kalam Technical University,Lucknow

| **Name of Developer** |  |
| --- | --- |
| **Institute** | **Rajshree Institute of Mnagement and Technology,Bareilly** |
| **Email id** | **jyoti.jolly79@gmail.com** |
| **Department** | Computer Science and Engineering |

**Mentor Details:**

| **Mentored by** | Dr. Sangeeta Arora |
| --- | --- |
| **Institute** | KIET Group of Institutions, Delhi-NCR, Ghaziabad |
| **Email id** | sangeeta.arora@kiet.edu |
| **Department** | Department of Computer Applications |

**Contributors List:**

| **SrNo** | **Name** | **Faculty or Student** | **Department** | **Institute** | **Email id** |
| --- | --- | --- | --- | --- | --- |
| 1 | Dr. Jyoti Agarwal | Faculty | Computer Science and Engineering | **Rajshree Institute of Management and Technology,Bareilly** | Jyoti.jolly79@gmail.com |
| 2 | Vaibhav Gupta | Student | Computer Science and Engineering | **Rajshree Institute of Management and Technology,Bareilly** | Bababgupta23@gmail.com |
| 3 | Ansh | Student | Computer Science and Engineering | **Rajshree Institute of Management and Technology,Bareilly** | Avilav218@gmail.com |
| 4 | Abhijeet Verma | Student | Computer Science and Engineering | **Rajshree Institute of Management and Technology,Bareilly** | versonu011@gmail.com |
| 5 | Ayush Gupta | Student | Computer Science and Engineering | **Rajshree Institute of Management and Technology,Bareilly** | ayugup1999@gmail.com, |