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| **Name** |  |
| **CMS ID** |  |
| **Date** |  |

**Objectives:**

After completing this Lab students will able to

1. Implement Queue using Array.
2. Implement Queue using linked lists.
3. Implement priority Queues.

For details and explanation of Queue ADT, please refer to the recommended book or lecture provided. You are supposed to perform the following tasks

1. Implement circular queues using Array. For array implementation, you need the following class

template <class Type>

class queueType

{

public:

bool isEmptyQueue();

bool isFullQueue();

void initializeQueue();

Type front();

Type back();

void addQueue(const Type& queueElement);

void deleteQueue();

queueType(int queueSize = 100); // Function with default parameters

queueType(const queueType<Type>& otherQueue);

// To create a Queue object that copies another queue

~queueType();

private:

int maxQueueSize; int count;

int queueFront;

int queueRear;

Type \*list;

};

Implement all the above methods and verify your results using the following code

queueType<int> Q1;

Q1.addQueue(15);

Q1.addQueue(25);

Q1.addQueue(4);

Q1.addQueue(12);

Q1.addQueue(123);

Q1.addQueue(75);

Q1.addQueue(85);

Q1.addQueue(55);

Q1.front(); // should display 15

Q1.deleteQueue();

Q1.printQueue();// should display all the queue element in the order they are added except 15

queueType <int> Q2(Q1);

Q1.addQueue(1000);

Q1.addQueue(2000);

Q1.printQueue(); // Should display all the members of Q1 in the order they are inserted except 15 as it was deleted earlier

Q2.printQueue();

// Should display all the members of Q2 i-e all the members of Q1 except for 1000 and 2000

Q1.initializeQueue();

Q1.printQueue();

//Should display a message "An empty Queue can't be displayed"

Q1.addQueue(35);

Q1.front();

Q1.addQueue(3);

Q1.printQueue();

//Should display both 35 and 3

1. Implement queue using linked lists. Most of you have already implemented in previous lab, so this is a bonus hit for them. Provide the same instructions as in Task 1 to validate your queue.