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**Department of (Computer Science)**

**Pak-Austria Fachhochschule: Institute of Applied Sciences and Technology, Haripur, Pakistan**

**COMP-112L Data Structure** **& Algorithm Lab**

**Lab Journal**

**Class: BS Computer Science**

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**Submitted to: Engr. Rafi-Ullah**

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**Instructor Signature**

**Lab No. 08**

**Queue**

**Objectives:**

In this lab we will be discussing about Queue in detail. This is one of the most important concepts in C++ language. A Queue is a linear structure which follows a particular order in which the operations are performed**.**

**Tools/Software Required:**

* All the tasks are implemented on DEV C++.

**Introduction:**

**QUEUE**

* A Queue is a linear structure which follows a particular order in which the operations are performed.
* The order is First In First Out (FIFO).
* A good example of a queue is any queue of consumers for a resource where the consumer that came first is served first.
* The difference between stacks and queues is in removing. In a stack we remove the item the most recently added; in a queue, we remove the item the least recently added.
* A queue is a useful data structure in programming. It is similar to the ticket queue outside a cinema hall, where the first person entering the queue is the first person who gets the ticket

**Lab Tasks:**

**Task 1:**

Design and implement a program using C++ having two interfaces one for Queue using Array and the other one is for Queue using Link List. User will choose the one he/she wants to use and will input (Enqueue) after the queue is filled, a function which prints the queue in reverse manner. After that remove half of data elements (Dequeue) and print the elements in queue.

**Code:**

**#include <iostream>**

**using namespace std;**

**int queue[10];**

**int n = 10;**

**int front = - 1;**

**int rear = - 1;**

**int enqueue() {**

**int val;**

**if (rear == n - 1)**

**cout<<"Queue Overflow"<<endl;**

**else {**

**if (front == - 1)**

**front = 0;**

**cout<<"Insert the element in queue : "<<endl;**

**cin>>val;**

**rear++;**

**queue[rear] = val;**

**}**

**}**

**void dequeue() {**

**if (front == - 1 || front > rear) {**

**cout<<"Queue Underflow ";**

**return ;**

**} else {**

**cout<<"\nElement deleted from queue is : "<< queue[front] <<endl;**

**front++;;**

**}**

**}**

**void Display() {**

**if (front == - 1)**

**cout<<"Queue is empty"<<endl;**

**else {**

**cout<<"\n Queue elements are : ";**

**for (int i = front; i <= rear; i++)**

**cout<<queue[i]<<" ";**

**cout<<endl;**

**}**

**}**

**int main(){**

**enqueue();**

**enqueue();**

**enqueue();**

**enqueue();**

**Display();**

**dequeue();**

**dequeue();**

**dequeue();**

**Display();**

**}**

**Output:**

**Text

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**Results & Observations:**

In this Lab I've learned about the concept of Queue & also understand that how we can insert a node by using Enqueue function and delete by using Dequeue function. Then by using Display function I’ve print out the node.