**UCS 2312 Data Structures Lab**

**Assignment 4: QueueADT and its application**

**Date of Assignment: 21.10.2022**

Create an ADT for the circular queue data structure using Singly Linked List with the following functions. Each node which consists of Job ID and Burst time. [CO1, K3]

1. createQueue(Q,size) – initialize size
2. enqueue(Q, data) – enqueue data into the queue
3. dequeue(Q)– returns the element at front
4. isEmpty(Q) – returns 1 if queue empty, otherwise returns 0
5. display(Q) – display the elements in queue

Test the operations of queueADT with the following test cases

|  |  |
| --- | --- |
| **Operation** | **Expected Output** |
| dequeue(Q) | Empty |
| enqueue(Q, J1, 2) | (J1,2) |
| enqueue(Q, J2, 13) | (J1,2), (J2,13) |
| enqueue(Q, J3, 5) | (J1,2), (J2,13),(J3,5) |
| dequeue(Q) | (J1,2) |
| display(Q) | (J2,13),(J3,5) |
| dequeue(Q) | (J2,13) |
| display(Q) | (J3,5) |

**Best practices to be followed:**

* Design before coding
* Usage of algorithm notation
* Use of multi-file C program
* Versioning of code

**Application using Queue**

1. Job scheduling

Insert queue with the following contents

(J1,2), (J2,4), (J3,8), (J4,5), (J5,2), (J6,7), (J7,4), (J8,3) (J9,6) & (J10,6)

Insert the job into the queue whichever is empty. If it is not empty, insert the job into the queue whichever is having minimum average time

Display the jobs waiting in both the queues along with their CPU burst time.

2. Build Queue using stacks