

## Lab 4 Simple Fixed Size Queues

Build both a **Pipeline** and a **Circular Queue** structure of fixed length size of 10 slots.

### Data Structure and methods for Queue:

- A Constructor to create and initialize the NODEELEMENT entries of the Queue.
- Method to INSERT an element at the back of the queue.
- Method to REMOVE an element at the front of the queue.
- Test for EMPTY and FULL conditions,
- Show the COUNT of the current elements in the queue (the current size).
- Show the TAIL element index and contents at the tail.
- Show the HEAD element index and contents at the head.
- A routine to show the contents of the entire data structure.
- Show all queue slots (indices) and their contents.

### Testing via the Main user interface:

Write a program that tests each of the methods used to manipulate the data structure.

Use a loop during data input.

When displaying the full structure use a loop that shows index and its content, one node at a time.

Your program should employ a menu that repeatedly prompts the user to perform the above functions. Demonstrate that it works for the structure's "boundary conditions".

Show all inputs, outputs, explanation of return codes, and any informational messages.