Major Topics on Queue

- Introduction of a queue
  - Definition of a queue
  - Queue Behavior
- Implementation of a queue
  - Queue as pointer
  - Queue as an array
- Oberon Programs
  - Module Guide
  - MIS
  - Source codes
  - Test Results
- Application for queues

Introduction of a queue

- Definition of a queue
  - List of data items with associated operations
  - Items may be any data type: simple or structured
- Queue Behaviors
  - Items may only be added at the back of the list
  - Items may only be removed from the front of the list
  - First item in is the first item out
    - Referred to as a FIFO data structure

Introduction of a queue

- Queue Behavior
  - – Create queue
    - Usually empty to begin with
  - – Is the queue empty?
  - – Is the queue full? (if needed)
  - – Add an item to the queue
  - – Remove an item from the queue
  - – Get the head item of the queue
  - – Get the rear item of the queue

Implementation of a queue

- A queue as pointer list
  - Head pointer to remember the head of the queue
  - Rear pointer to remember the rear of the queue
  - Is queue is full? No memory
  - Is queue is empty? Head = Rear = NIL
  - Can new element be added to the queue?
    - QueueIfFull : exception : add to the rear
  - Can the element be removed from the queue?
    - QueueIfEmpty : exception : remove from the head

Implementation of a queue

- A queue as an array
  - – CurrentPosition in the array
  - – Is queue is full? CurrentPosition = Maxsize
  - – Is queue is empty? CurrentPosition = 0
  - – Can new element be added to the queue?
    - QueueIfFull : exception : add to the rear
  - – Can the element be removed from the queue?
    - QueueIfEmpty : exception : remove from the head

Module Guide

- Module Name : QueueModule
- Secret : Data structure of the queue
- Service :
  - Judge if the queue is empty
  - Add to the queue and remove from the queue
  - Get the head of the queue and the rear of the queue
- Expected changes :

  In this module an array is used to describe the queue.In the future a pointer list can be used to describe the queue.