

# Data Structures Lab – Queue (array)

## **Overview**

Implement a queue of int using an **array-based** implementation.

## **Part 1**

1. Create a QueueArray class and add private member variables as necessary for an array-based queue.
2. Implement the following functions:
  - a. Default constructor
  - b. void enqueue(int item);                      // Add an item to the queue
  - c. int dequeue();                                // Remove an item from the queue
  - d. void show()                                    // Shows all queue data on screen
3. Inside of main you should create an instance of Queue. You should enqueue and dequeue items on to the queue. Make sure you call the show method a few times to show how the contents of the queue changes.

## **Part 2**

1. Implement more of the QueueArray methods
  - a. void makeEmpty();                            // Clears the queue
  - b. boolean isEmpty();                           // Is the queue empty true/false
  - c. boolean isFull();                            // Is the queue full true/false

## **Part 3**

1. Implement more of the QueueArray methods:
  - a. Constructor that takes an QueueArray as a parameter. It should make a deep copy of the data in the queue parameter.
  - b. void copy(QueueArray source). It should make a deep copy of the data in the queue parameter.

## **Part 4**

Update the QueueArray class so that it can use generics. You should be able to create instances of Queue that can store any data type.