Queues

definition
- a specialized structure that we as programmers use as a tool to help us solve problems
- a container that allows enqueue and dequeue operations
- enqueue: add an item to the end of the container
- dequeue: remove the item from the front of the container (returns its value)
- insertion occurs at one end; deletion at the other end
- think about the long line waiting for the newest iPhone
- this is a FIFO (first-in-first-out) data structure (or LILO)

uses
- printer spooling
- storing keystrokes (ever re-hit keys your CPU was too slow to apply?)

typical operations
- Enqueue()
- Dequeue()
- Peek()
- Size()
- IsEmpty()
- IsFull()

complexity
- enqueue: O(1)
- dequeue: O(1)

other types
- priority queue
  - items ordered by key
  - think about the line to a concert with vips (they can cut in line)
  - or bills as you receive them (more important ones need to be payed first)
  - complexity
    - enqueue: O(n)
    - dequeue: O(1)

queue vs. list
- could we use our list as the basis for a queue?
- how would we implement Enqueue()?
- what about Dequeue()?
- how are Size(), IsEmpty(), and IsFull() different, if at all?