

Queues

Queue

- A list with the operations:
 - Enqueue: append an element to the end of the list
 - Dequeue: remove the element from the start of the list, get its value
- “FIFO”: first in, first out
- Linked list implementation: enqueue and dequeue are both $O(1)$
 - Need to store the head and the “tail” of the linked list

Queue: circular array implementation

- Store elements in an array, keep the index of the first element (front) and the number of elements (nitems)
- Store a new element in
$$\text{index} = (\text{front} + \text{nitems}) \% \text{max_size}$$



max_size = 6

front = 4

nitems = 3

Queue: circular array implementation

- Dequeue: $O(1)$
- Enqueue: $O(1)$
 - Assuming we never need to resize