

Double-Ended Queues

→ supports insertion and deletion at both ends of queue

Deque ADT

- `D.add-first(e)`: add `e` to front of `D`
- `D.add-last(e)`: add `e` to back of `D`
- `D.delete-first()`: remove and return first el from `D`
- `D.delete-last()`: remove and return last el from `D`

Implementing Deque w/ Circular Array

→ whenever we need to know index of back of deque, use modular arithmetic

$$\text{back} = (\text{self}.\text{front} + \text{self}.\text{size} - 1) \% \text{len}(\text{self}.\text{data})$$

→ rely on modular arithmetic to circularly decrement index

$$\text{self}.\text{front} = (\text{self}.\text{front} - 1) \% \text{len}(\text{self}.\text{data})$$