

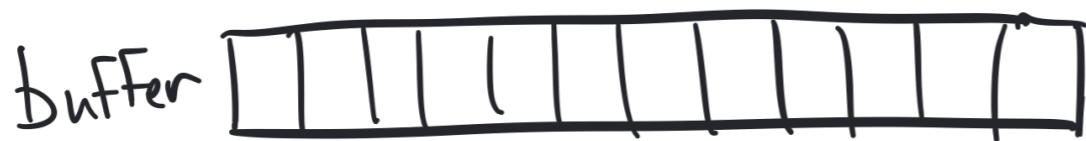
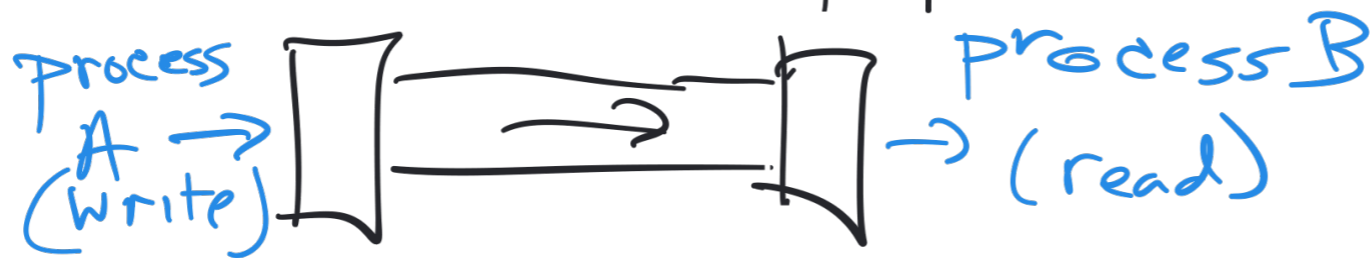
CS 208

Fri, 3 March 2023



ls | wc

What's in a pipe?



Problem 1: A calls write when buffer is full

Problem 2: B calls read when buffer is empty

("readers/writers problem")

("Dining philosophers")

Want:

if this happens,

A should

block/sleep;

once the buffer is not full

A should wake up.

Semaphore ← Edsger Dijkstra

counter

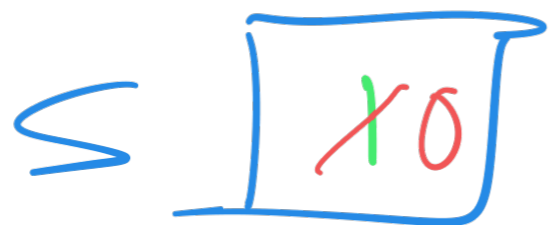
queue of sleeping threads

operations: initialize

up
down

Thread A:
down(s) ← ok

Thread B:
down(s)



DOWN

if s.counter > 0

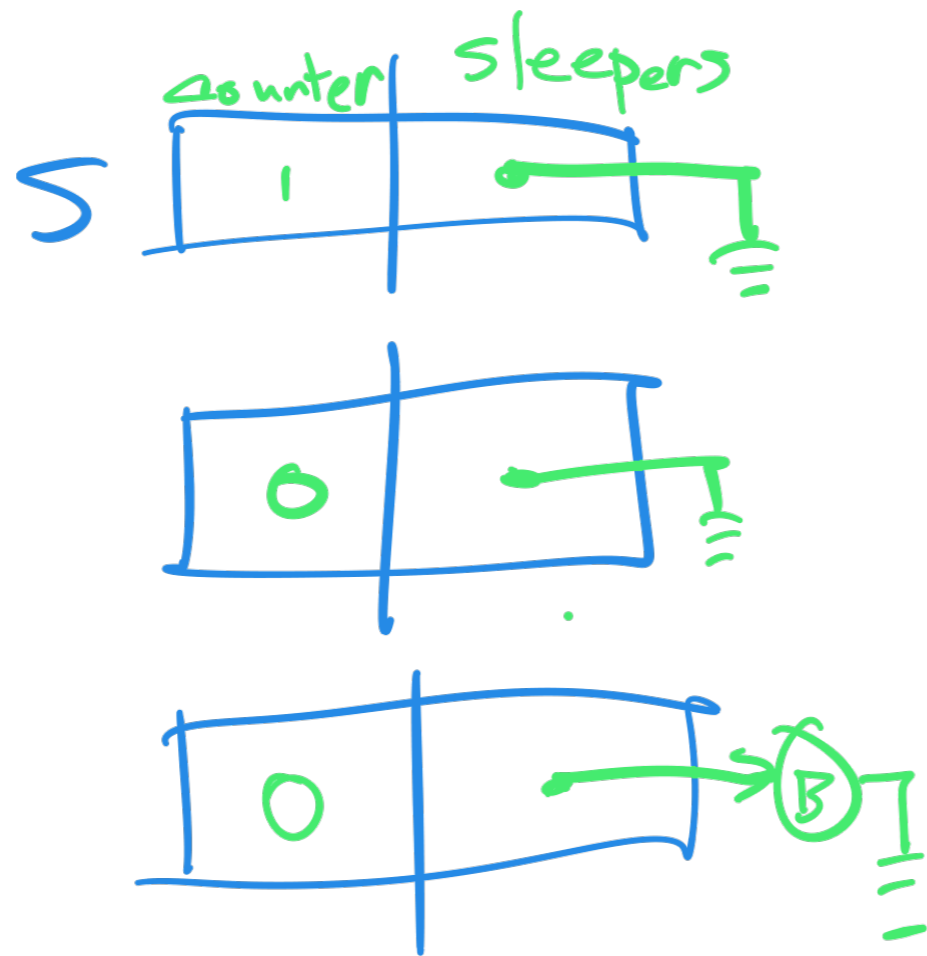
s.counter --



else

put caller to sleep

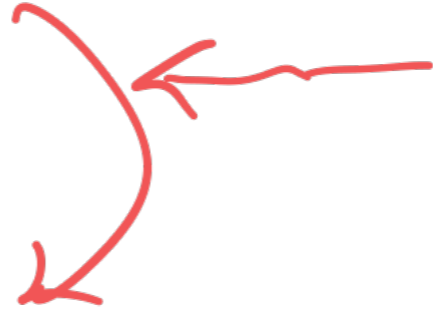
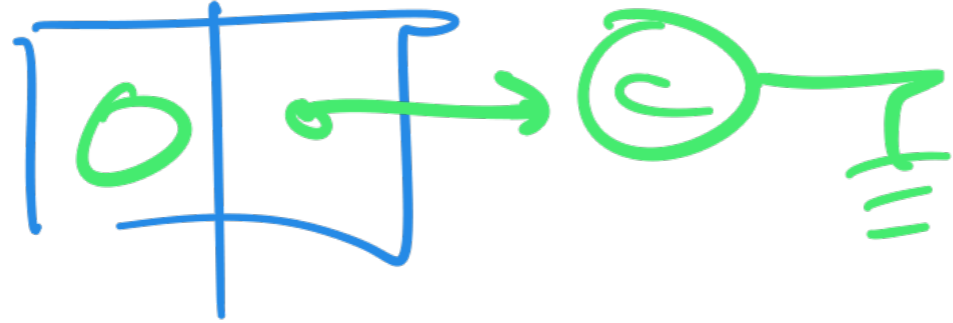
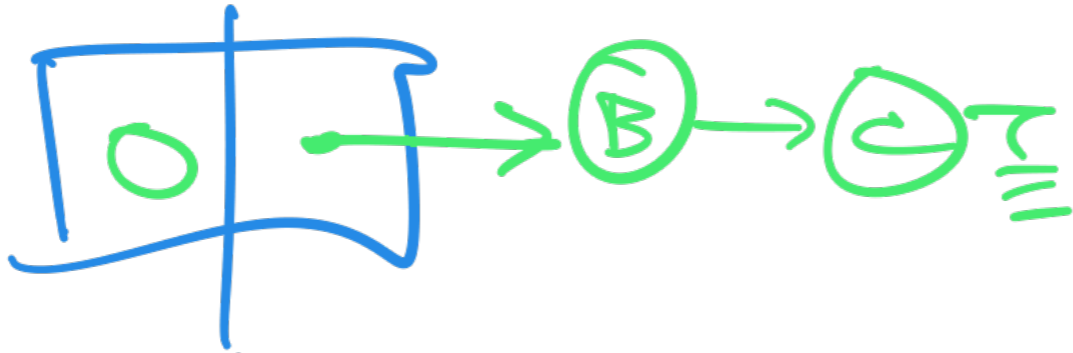
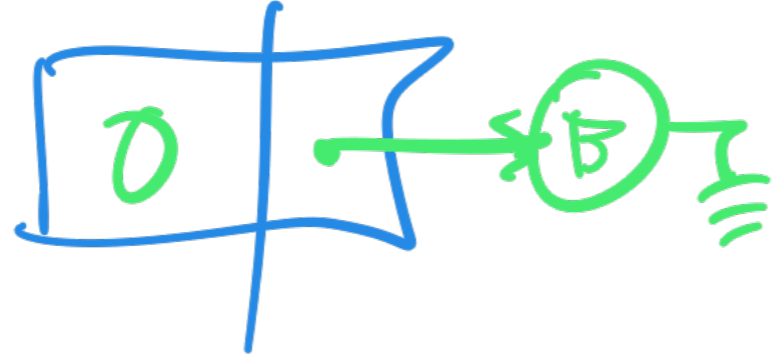
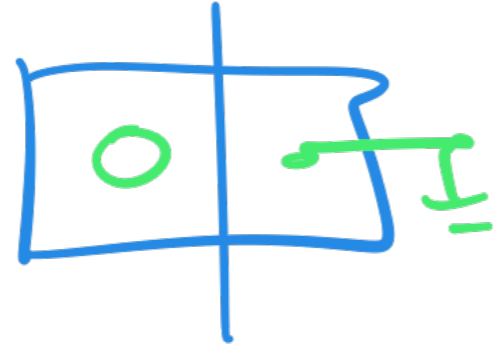
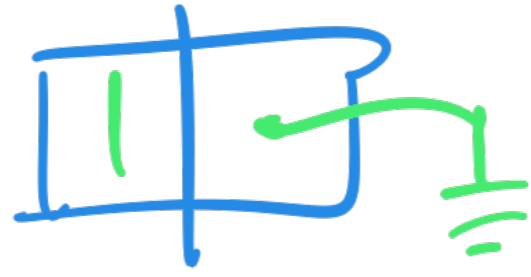
→ s.sleepers.add(caller)



A: down(s)

B: down(s)

Up: if $s.\text{counter} = 0$ && $s.\text{sleepers}$ is empty)
 wake up first item
 in sleepers + remove from
 s sleepers
 else:
 s.counter++



A: down

B: down... ~~zzzzzz~~

C: down... zzzzzz

A: up