25 Feb 2025 - Operating Systems - II - Week 08

Put and Get routines ($\overset{\text{other}}{\text{book}}$)

Adding the full and empty conditions

```
sem_t ~ ;
sem_t ~ ;

main ( ) {
sem_init (          ) ;   // MAX are empty
sem_int (          ) ;   // 0 are full
}
```

sem_wait ≡ wait (decrements)

$\underbrace{\text{sem\_post}}_{\text{inbuilt in pthreads}}$ ≡ signal (signals other thread)

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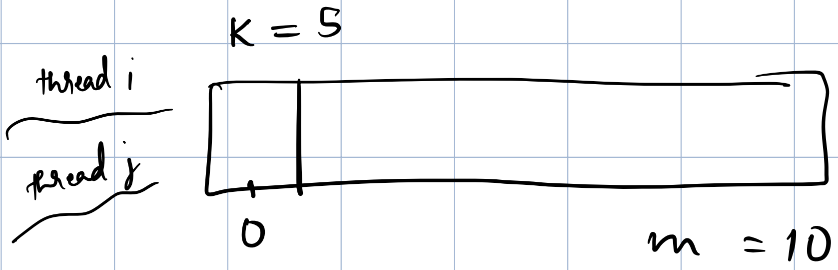
Code Pg (398 / 436 of 747)

Problem ?

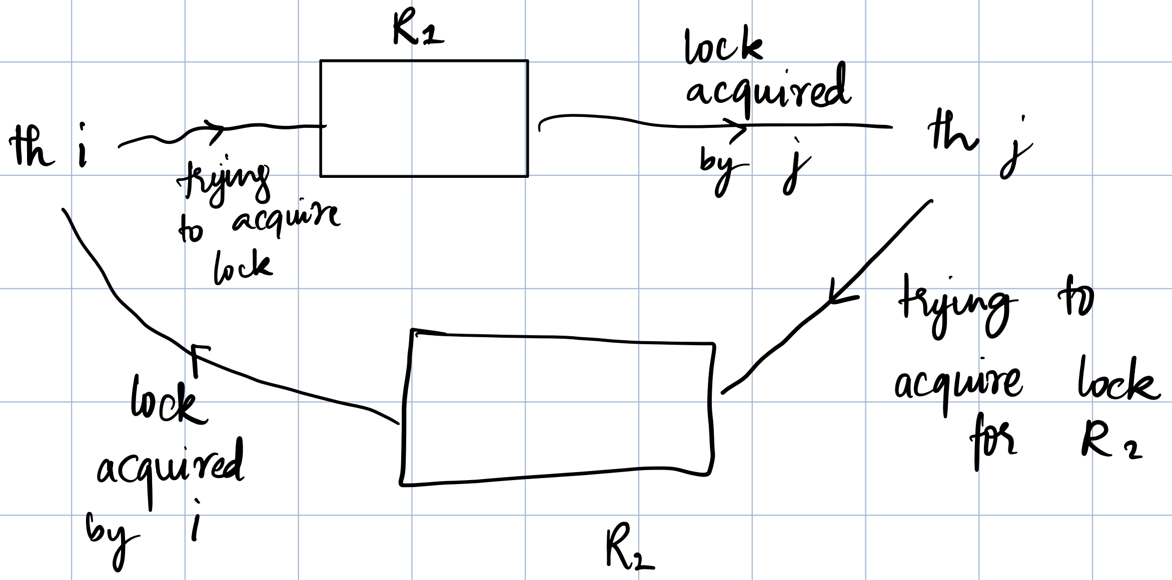
- when 2 threads try to put() → Pg 397



} → if empty > 1 2 threads can produce

Same mutex for both producer and consumer → ∴ fill and use

Problem : deadlock



sem_wait (&mutex)
sem_wait (&empty)
⋮

sem_wait (&empty)
sem_wait (&mutex)

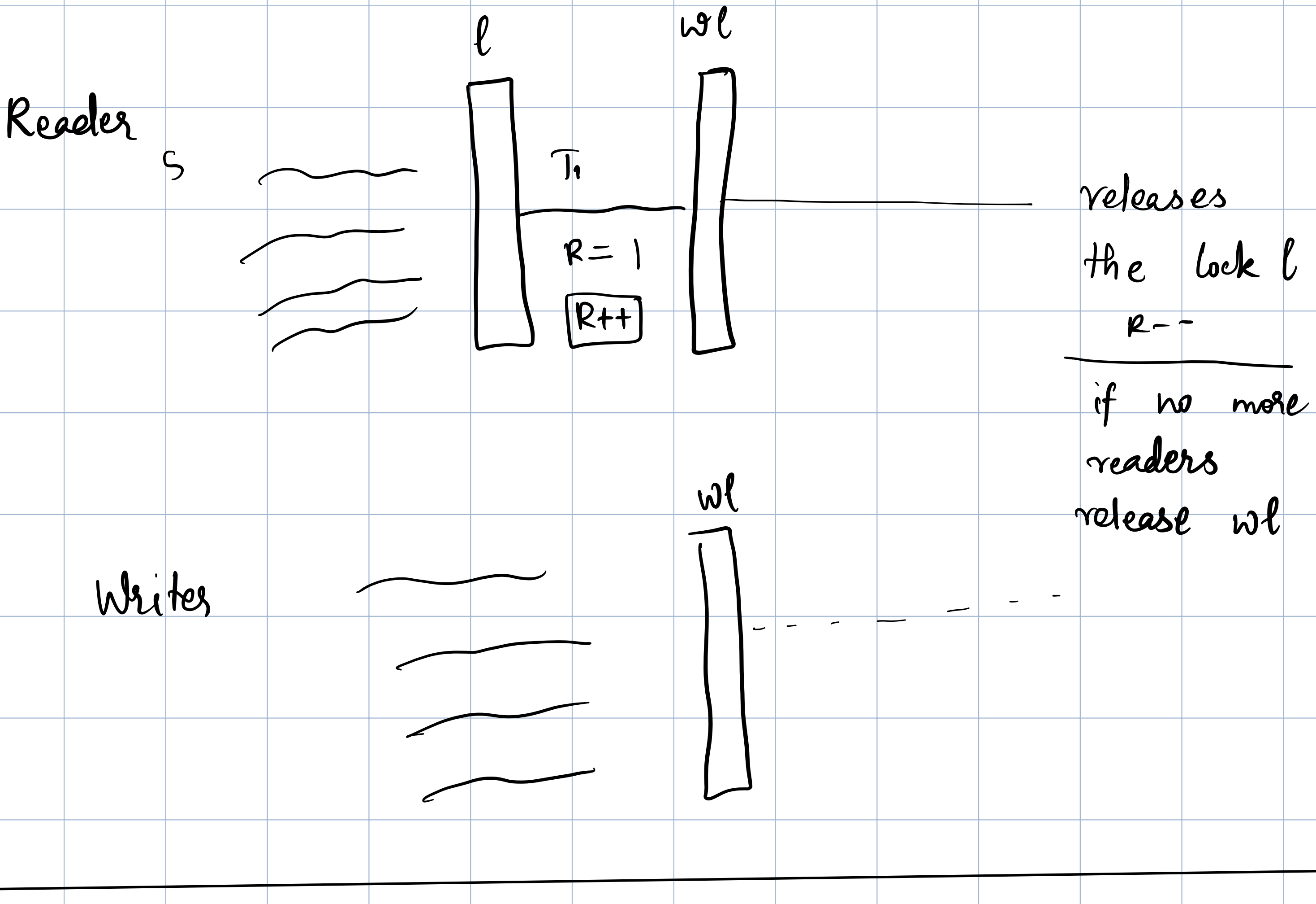
Bounded waiting → as long as semaphores are fair

Readers - Writers Problems

Multiple readers — ok

Writer and reader / writer and writer — no

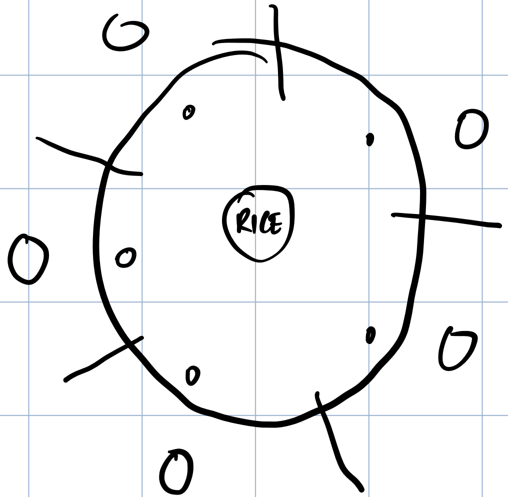
Writer ↓ can do both read and write



releases
the lock l
R--

if no more
readers
release wl

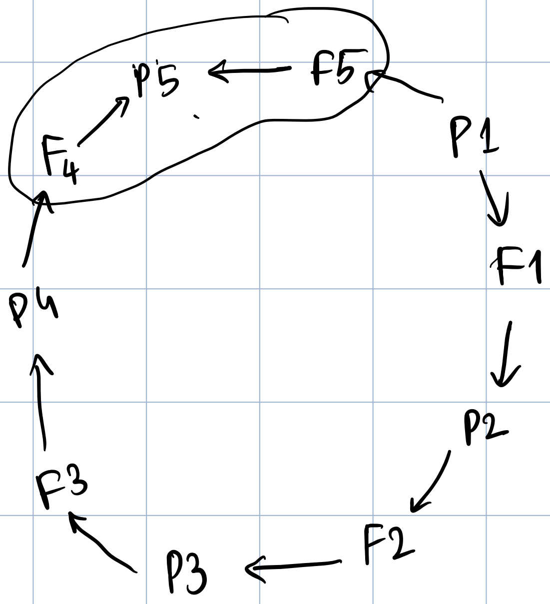
The Dining Philosophers



Shared data = Bowl of rice

and

semaphore chopstick[5] initialized to 1.



Monitors

~ C++ class