Java monitor-only 1 condition var

- can structure so each and var = predicate

wait:
  while (!predicate)
    Wait(C)

Example: bounded buffer problem

  int N_items
  queue
    Condition Empty
    Condition Full
  read()
    { while (N_items == 0)
      wait(empty)
    }
  write
    { while (N_items == max)
      wait(full)
    }
  get
    N_items--
    Signal(full)
  put
    N_items++
    Signal(empty)

in java, do notifyAll instead of notify
"thundering herd" problem - everyone wake up and check

barber problem

chairs □□□□□

filled chairs is not

steady state

Customers

N * λ = 0.1

Barber chair □

μ = 0.8
Customer States

- Waiting
- Getting haircut
- Sleeping
- Cutting

Barber states

Each is separate point of waiting (synchronization wait)

* = time delay (sleep cmd)

Question in class about thread fns

Barbershop obj

Methods:
- barber()
- customer()

Threads:
- Barber thread
  - while true
    - barber()
- 10x customer thread
  - while true
    - sleep (exp(0.1))
    - customer()
Java version of sleeping barber (q3)
- same as q2 except use notifyAll()
  When you want to signal the condition

q4
- want single thing trucking state -> barber shop obj

[boxed]
midterm exam — next Thursday 2/26

- basic machine + process model
  (memory map, stack, subroutine linkages..)
- OS abstraction layer — syscall table
- threads + context switching
- mutual exclusion — mutex/semaphore/monitor
- deadlock — ways of creating
  should be able to construct a deadlock
  from an example
  ways of dealing — ranking
  FSM view of multiple threads
  (model view)

- queuing — M/M/1/ECN, markov model
  expected queue length
  \[ \rho \frac{\lambda}{\lambda - \mu} \]

- 32-bit page table, TLB
midterm topics

- page fault handling: fix + retry or die (except for virtualization)
  - lazy allocation
  - copy on write
  - demand paging

- allocators - fragmentation (internal/external)
  - buddy alg

- page replacement - random, FIFO, LRU, clock, OPT

- virtualization - sensitive/innocuous instruction
  - trap + emulate + return to next insn