* CONCURRENCY
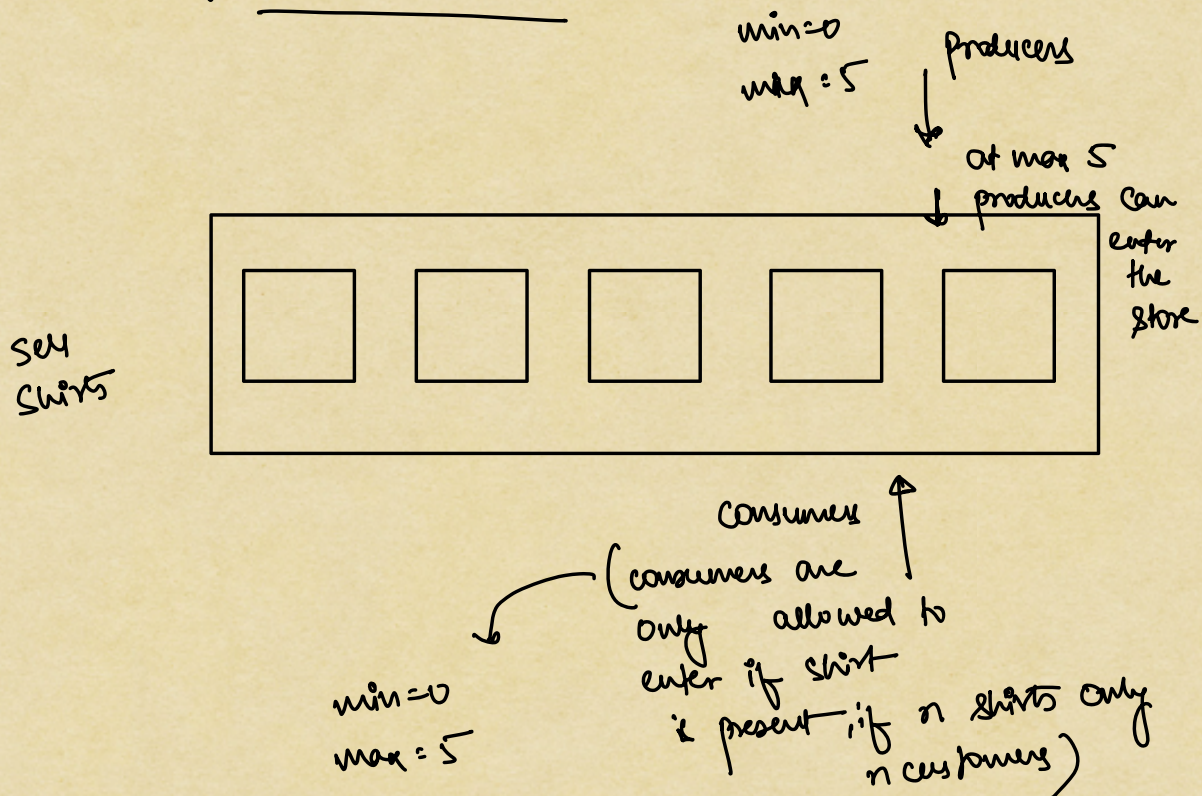
- → Semaphores
- → Synchronised ✓
- → Atomic Integer (Concurrent
- → Deadlocks
- → Static & multi-threading ✓
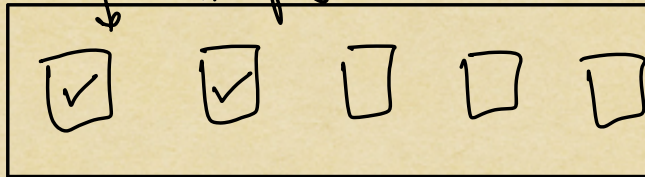
: SEMAPHORES

min = 0
max = 5

Producers

At max 5 producers can enter the store

Sell Shirts

Consumers

(consumers are only allowed to enter if shirt is present , if n shirts only n customers)

min = 0
max = 5

Store ⇒ Queue< Shirt >   max size = 5
                        min size = 0.

Producer 5 4 3 2 3

enters CS ⇒ no. of producers that can enters ⇒ — —
              no. of consumer "   "   "   ⇒ + p

         9   no. of consumers — —
              " " producers   p p
    Consumer 0 1 2 3 2

                  ↓
Semaphore (⊙) ⇒ keys - -
                        ↓

acquire   release   [0 — 5]
   | ↓
  CS   (key++)
 (key--)
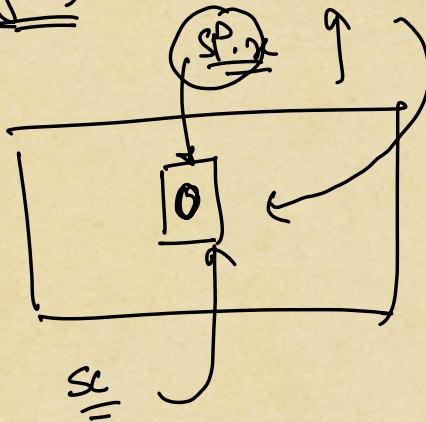
count - -   SP.
                        ┌──────────┐
                        │   [0]   │
                        │   │
                        └──────────┘
(1)(1)   SC
   ↓
   O   SC.r

Semaphore S = new Semaphore(1);

$\downarrow$

mutex

=) Atomic Integer :) default thread safe