

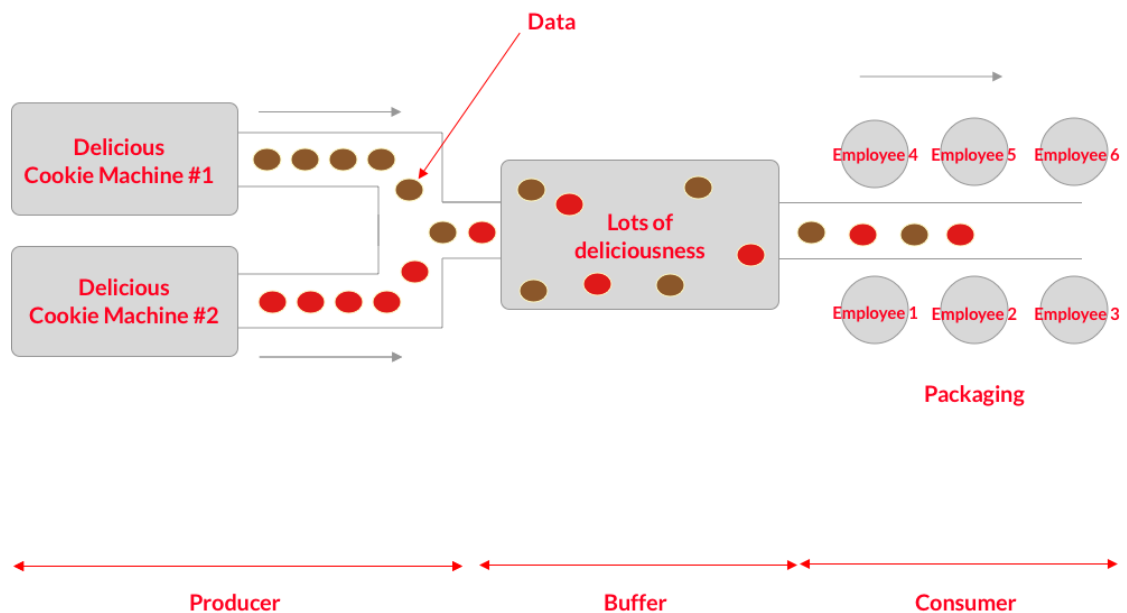
# CSC369 Week 3 Notes

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## 1 Synchronization

- Producer and Consumer Problem
  - Is also known as **bound-and-buffer** problem
  - Achieves synchronization
  - Has two types of processes
    1. **Producer**
      - \* Produces data
      - \* Puts data into buffer
    2. **Consumer**
      - \* Consumes data
      - \* Removes data from buffer, one piece at a time
  - It's like kimchi factory, or delicious cookie factory :)

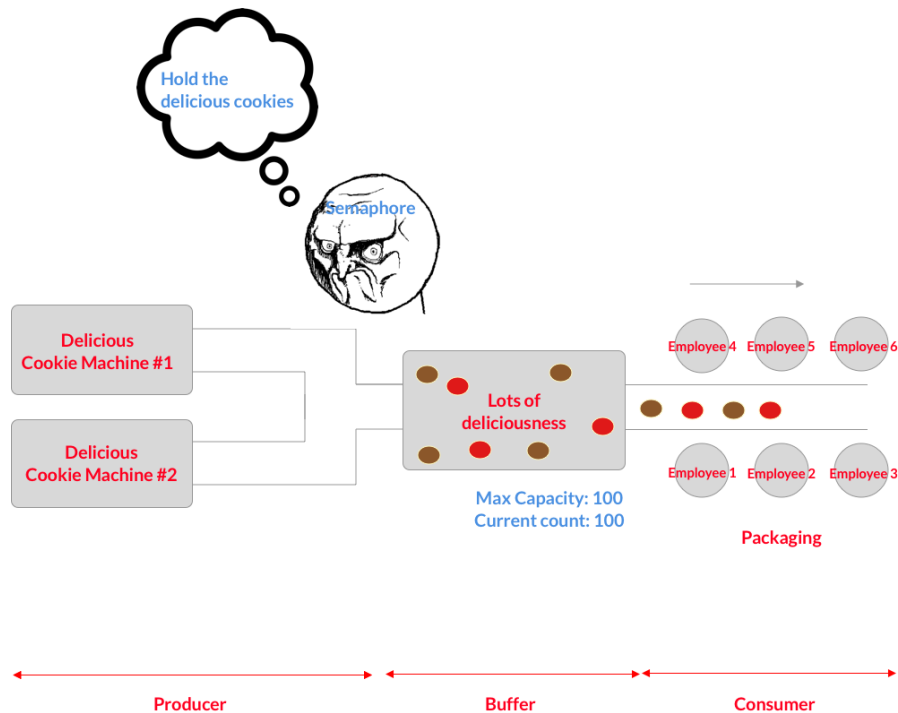


- Semaphore
  - Developed by Dijkstra in 1962.
  - Provides synchronization
  - Works like a signal
    - \* Uses a non-negative integer variable that is shared between threads [*Note: Need to come back later*]
    - \* Has two “**atomic**” operations
      1. **Wait** (Also called P, or decrement)
      2. **Signal** (Also called V, or increment)

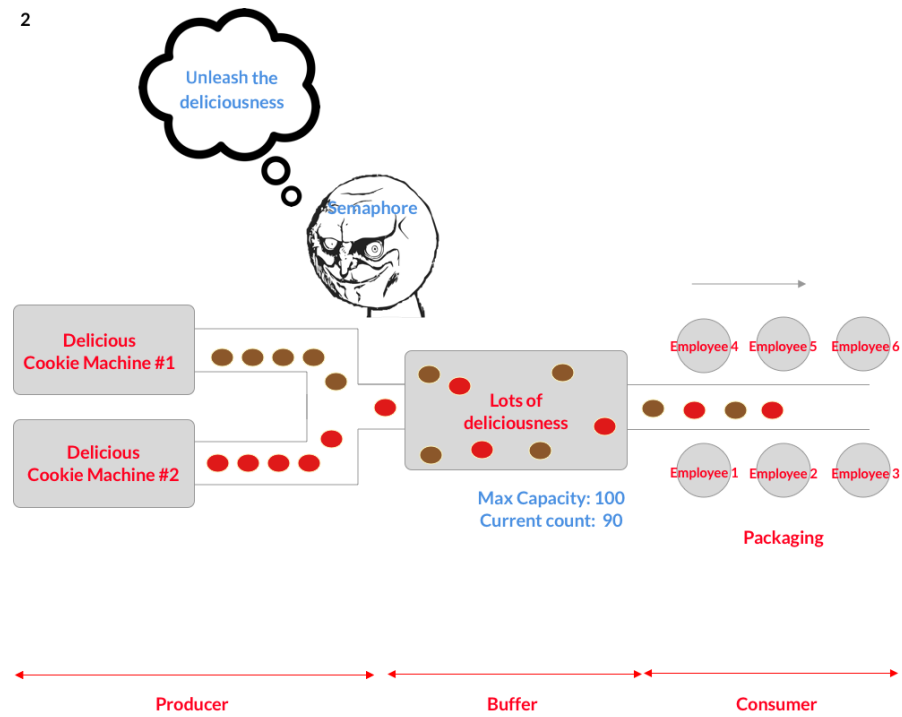
- Types of Semaphores

1. Counting Semaphore

- $count = N \Rightarrow$  Max number of resources
- $count \uparrow$  when resource added
- $count \downarrow$  when resource used
- $count = 0 \Rightarrow$  No resources available  $\Rightarrow$  **Wait** until  $count > 0$



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## 2. Mutex (Binary) Semaphore

- works like a lock