Lec-18

* Producer - Consumer Problem (Bonded Buffer Problem)

1. Producer thread
2. Consumer thread

Problem???

→ C.S (Buffer) → Sync. b/w Producer & consumer.

→ Producer must not insert data when the buffer is full.

→ Consumer must not pick/remove data when the buffer is empty.

Soln Semaphores

① m, mutex → Binary sema. used to acquire lock on buffer.

② empty → a counting sem. initial value is n
↳ tracks empty slots.

③ fill → tracks filled slots.
— initial = 0.

Producer

```
do {
    wait(empty); // wait until empty > 0
                 // then, empty->value--
    wait(mutex);
    // C.S, add data to buffer
    signal(mutex);
    signal(full); // increment full->value)
} while(1)
```

Consumer

```
do {
    wait(full); // wait until full > 0, then full--;
    wait(mutex);
    // remove data from Buffer
    signal(mutex);
    signal(empty); // increment empty,
} while(1)
```