Graduate Operating Systems

Spring 2022

1

Race Condition & Critical Sections


```
do {

    entry section

        critical section

    exit section

        remainder section

} while (TRUE);
```
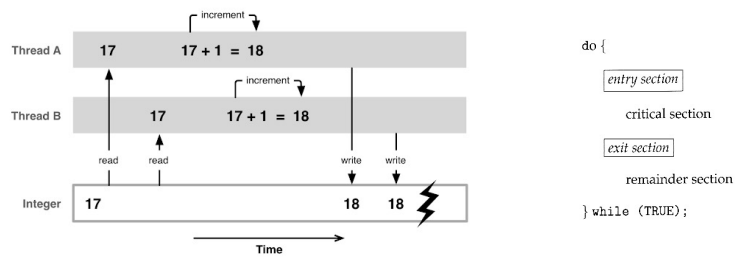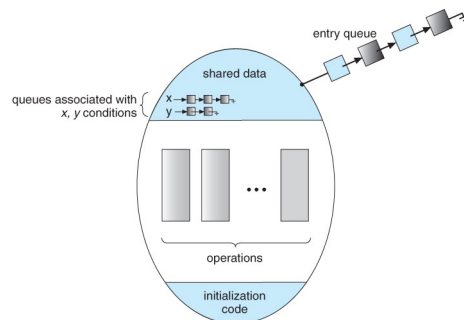
2

Semaphores

Semaphore *S* – integer variable

Can only be accessed via two indivisible (atomic) operations:

- wait() and signal(), originally called P() and V() respectively

- wait (S) {
    while (S <= 0)
                ; // do nothing while (S<=0)
        S--;
}
- signal (S) {
    S++;
}

3

Paper "Monitors"

4

Paper "Monitors"

- Examples:
  - Condition variables
  - Bounded Buffer
  - Scheduled Waits
  - Readers and Writers

5