

# Semaphore Implementation

```
struct semaphore {
    int value;
    queue Q;
}

void init(sema, value) {
    sema->value = value;
}

void P (sema) {
    disable_interrupts();
    while (sema->value == 0) {
        enqueue(sema->Q, current_thread);
        thread_block(current_thread);
    }
    sema->value--;
    enable_interrupts();
}

void V (sema) {
    disable_interrupts();
    if (!isEmpty(sema->Q)) {
        thread_unblock(dequeue(sema->Q));
    }
    sema->value++;
    enable_interrupts();
}
```

Other interesting  
synchronization problems