



(bad) implementation of a spin lock

```
struct lock {  
    int held = 0;  
}
```

```
void acquire (lock) {  
    while (lock->held);  
    lock->held = 1;  
}
```

```
void release (lock) {  
    lock->held = 0;  
}
```



What is the context switch  
happens in between?

➡ We have a race condition

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# The hardware to the rescue

- test-and-set (TAS x86 CPU instruction)  
atomically writes to the memory location  
and returns its old value in a **single indivisible step**
- ➔ the caller is responsible for testing if the operation has succeeded or not

```
bool test_and_set(bool *flag) {  
    bool old = *flag;  
    *flag = True;  
    return old;  
}
```

This is pseudo-code!  
The hardware execute this atomically