Race Condition & Critical Sections

```c
int x = 17;

void read(int *p) {
    p = 17;
}

void write(int *p) {
    *p = 18;
}

void read_write(unsigned int *p) {
    read(p);
    write(p);
}

do {
    entry_section:
    critical_section:
    exit_section:
    remainder_section:
}
while (TRUE);
```
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++;
   }

Paper “Monitors”
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- Condition variables
- Bounded Buffer
- Scheduled Waits
- Readers and Writers