Race Condition & Critical Sections

do |
    entry section
    critical section
    exit section
    remainder section
    while (TRUE);

Thread A

Thread B

Integer

Time
Semaphores

Semaphore $S$ – integer variable

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

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

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

Paper “Monitors”
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• Examples:
  – Condition variables
  – Bounded Buffer
  – Scheduled Waits
  – Readers and Writers