

A Solution for Exercise 7

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Problem

Task: Implement **anonymous**, obstruction-free binary consensus using **finite** number of counters

An Algorithm

uses: C_0, C_1 – counters

upon *propose*(v) **do**

while *true* **do**

$(x_0, x_1) \leftarrow \text{readCounters}()$

if $x_0 > x_1$ **then** $v \leftarrow 0$

else if $x_1 > x_0$ **then** $v \leftarrow 1$

if $|x_0 - x_1| \geq n$ **then return** v

$C_v.\text{inc}()$

How to Read Both Counters Atomically?

```
upon readCounters() do  
  while true do  
     $x_0 \leftarrow C_0.read()$   
     $x_1 \leftarrow C_1.read()$   
     $x'_0 \leftarrow C_0.read()$   
    if  $x_0 = x'_0$  then return ( $x_0, x_1$ )
```

The algorithm is an **obstruction-free** (lock-free, to be precise) atomic snapshot of the values of the counters