Solution to Exercise 3.1

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EPFL / LPD

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Binary Consensus

Some processes *propose* values (0 or 1) and eventually *decide* some values (0 or 1).

Validity : Every value decided is a value proposed

Agreement : No two processes decide different value

Wait-freedom : Every correct process that proposes a value eventually decides a value.

Binary Consensus from Write-Once Registers

We use a single write-once register *r*:

```
upon propose(v)
  r.write(v)
  return r.read()
```

Binary Consensus from a Queue

We use:

- a queue *q* initialized to ⟨ *winner*, *loser* ⟩,
- array of atomic registers *r*[1..2].

Algorithm for process p_i, $i = 1, 2$:

```
upon propose(v):
  r[i].write(v)
  w := q.deq()
  if w = winner then return v
  else return r[3-i].read()
```