Fairness

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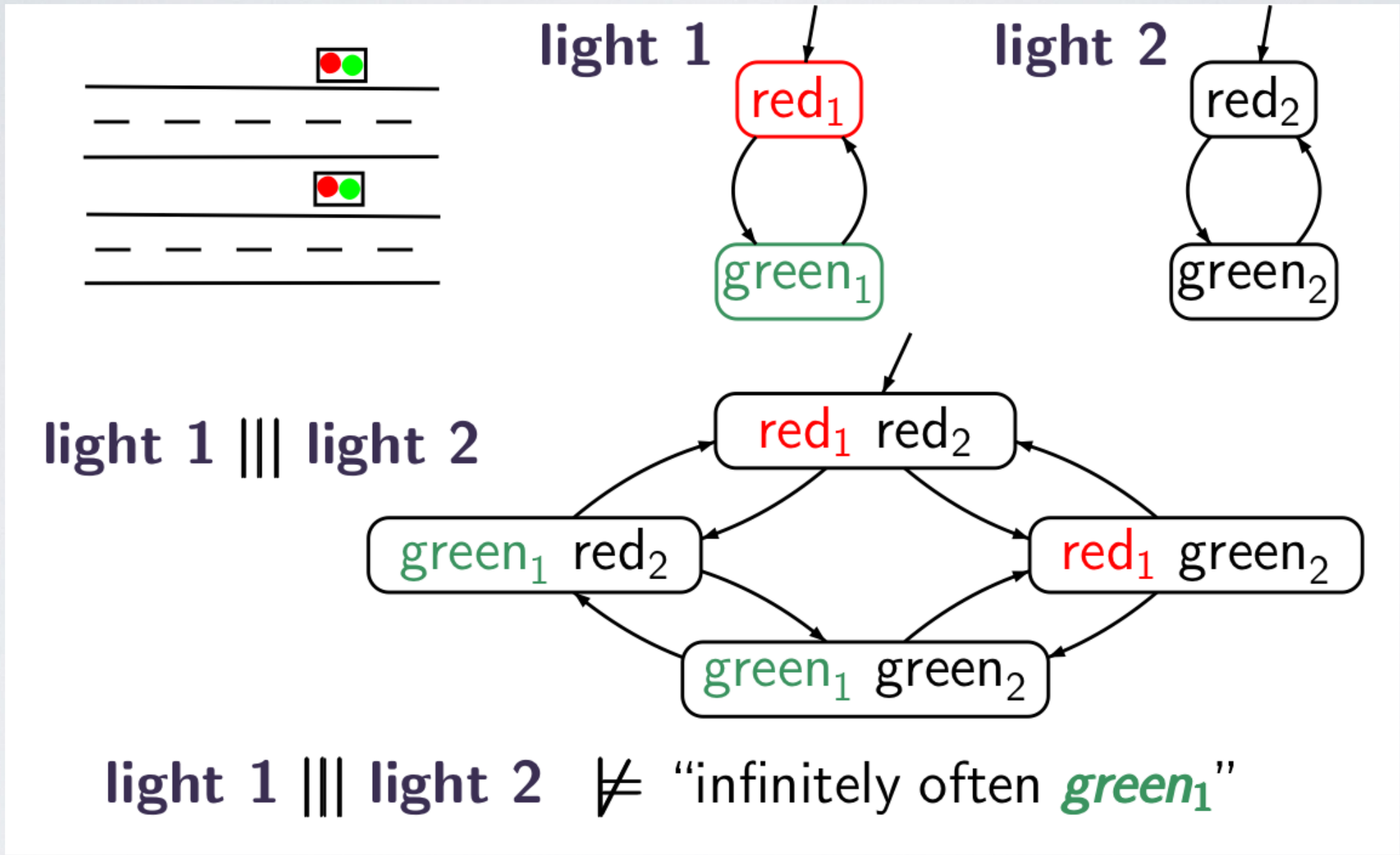
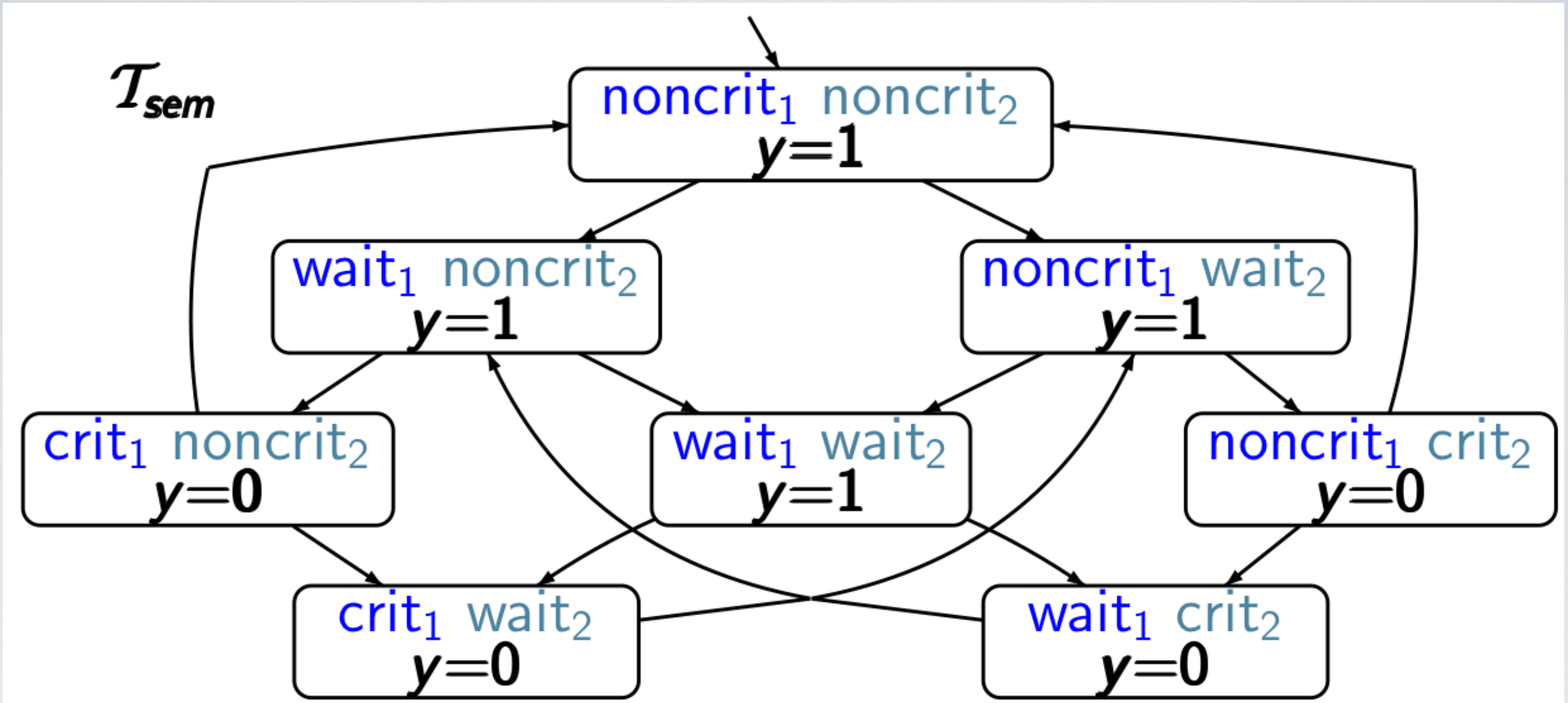
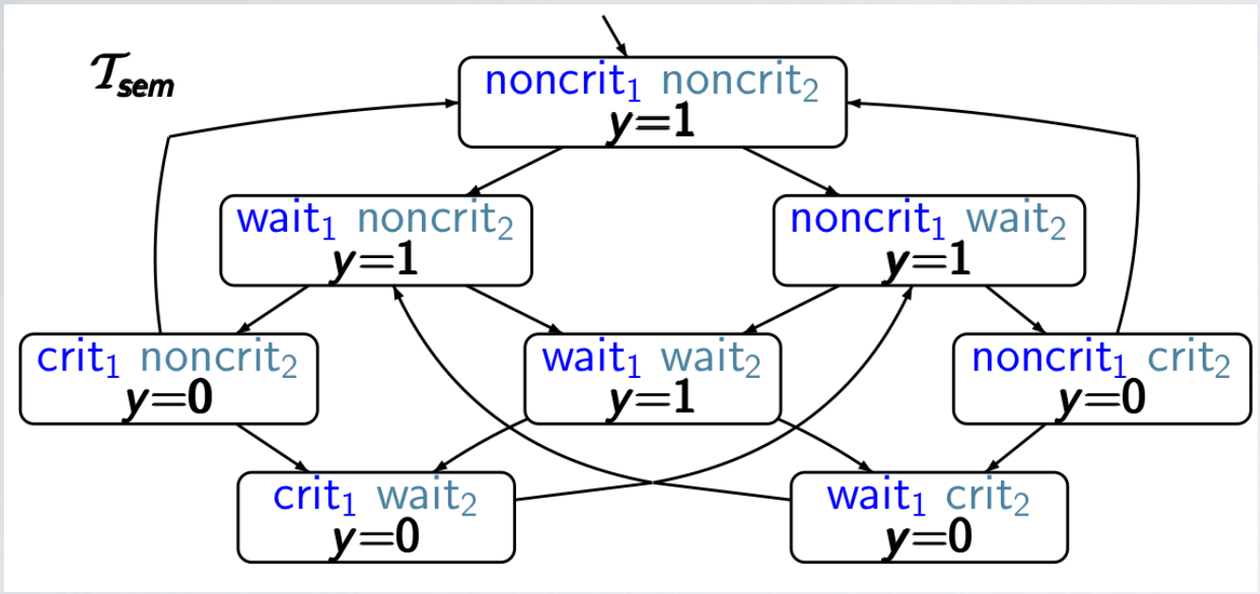
Unfair violation of liveness properties



Liveness properties are often violated although we expect them to hold



Each waiting process will eventually enter its critical section



Unconditional fairness:

every process gets its turn infinitely often

Strong fairness:

every process enabled infinitely often gets its turn infinitely often

Weak fairness:

every process that is continuously enabled from a certain moment, gets its turn infinitely often.

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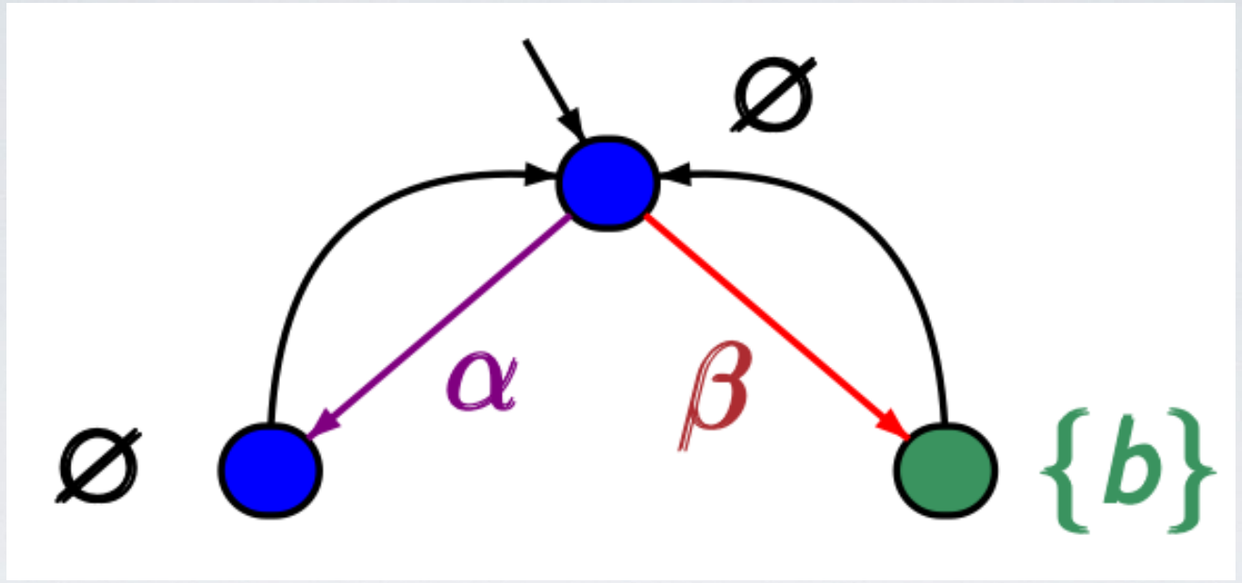
(unconditionally fair) ⇒ (strongly fair) ⇒ (weakly fair)



Is “infinitely often b” true for executions that are:

- Unconditionally fair wrt. α and β ?
- Weakly fair wrt. α and β ?
- Strongly fair wrt. α and β ?

Express all three fairness conditions in LTL