

Concurrency Theory WS 2017/2018

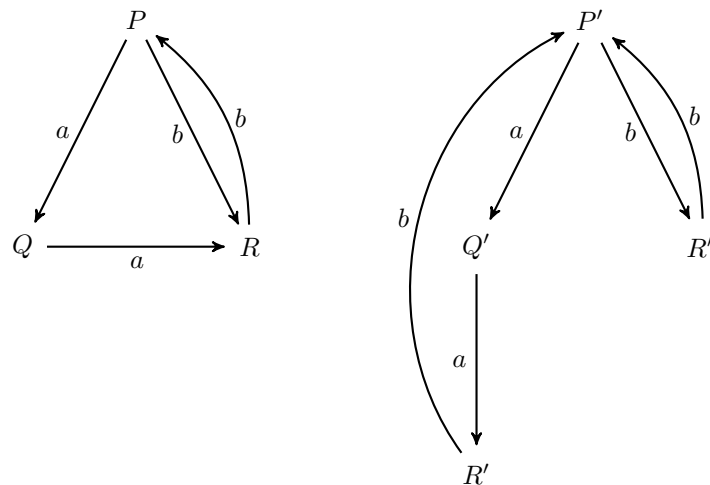
— Series 7 —

Hand in until December 8 before the exercise class.

Exercise 1 (Strong Bisimulation)

(1+1+1 Points)

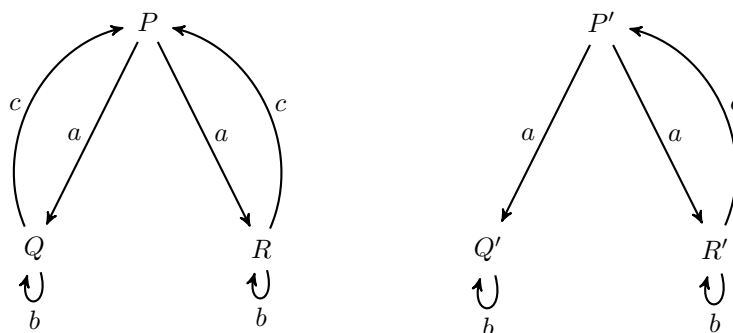
Consider the following LTS:



1. Give the smallest strong bisimulation of the above LTS.
2. Give the smallest strong bisimulation \mathcal{R} , such that $P \mathcal{R} P'$.
3. Prove or disprove: \mathcal{R} is an equivalence relation.

Exercise 2 (Trace Equivalence and Strong Bisimulation) (1+1 Points)

Consider the following LTS:



1. Show that $P' \equiv_{\text{TR}} P$, where \equiv_{TR} denotes trace equivalence.
2. Give \sim . Does $P \sim P'$ hold?



Exercise 3 (Traces & Congruence)

(1+1 Points)

Prove or disprove the following statements.

1. Trace equivalence is a congruence w.r.t. \parallel
2. Completed Trace equivalence is a congruence w.r.t. the restriction-operator.

Exercise 4 (Game Characterization of Bisimulation)

(3 Points)

Prove Theorem [Stirling 1995, Thomas 1993] on Slide 10 in Lecture 13 (page 35).