

Comet – exercices 2

Bring your answers to the course on sept. 28th

1 A property of weak bisimilarity

Prove the following law for weak bisimilarity:

$$\forall P, Q. a.(P + \tau.Q) + a.Q \approx a.(P + \tau.Q)$$

2 Up to Transitivity

1. Prove rigorously that the technique “up to transitivity”, defined by the following diagram, is a sound up-to technique for strong bisimulation.

$$\begin{array}{ccccc} P & \mathcal{R} & & Q & \\ \mu \downarrow & & & & \downarrow \mu \\ P' & \mathcal{R}\mathcal{R} & & Q' & \end{array}$$

Above, $\mathcal{R}\mathcal{R}$ stands for $\{(A, C). \exists B. A\mathcal{R}B \text{ and } B\mathcal{R}C\}$, that is, the composition of \mathcal{R} with itself.

2. Is up to transitivity sound for weak bisimilarity as well? (same diagram as above, with $\hat{\mu}$ instead of μ in the answer to the challenge).