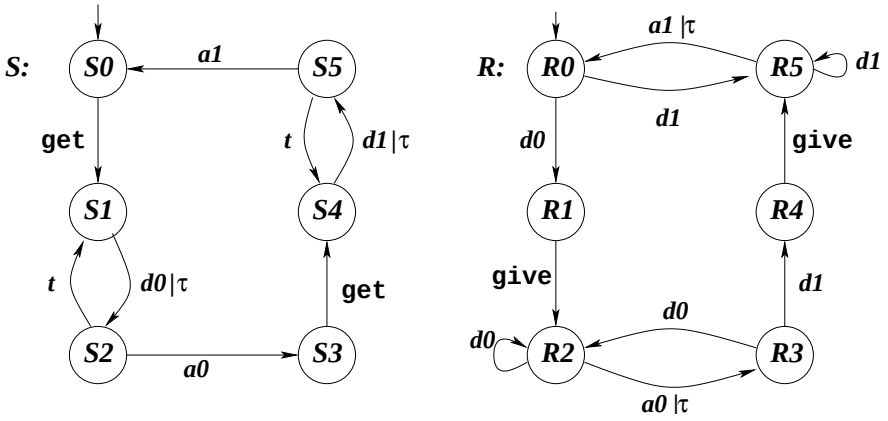
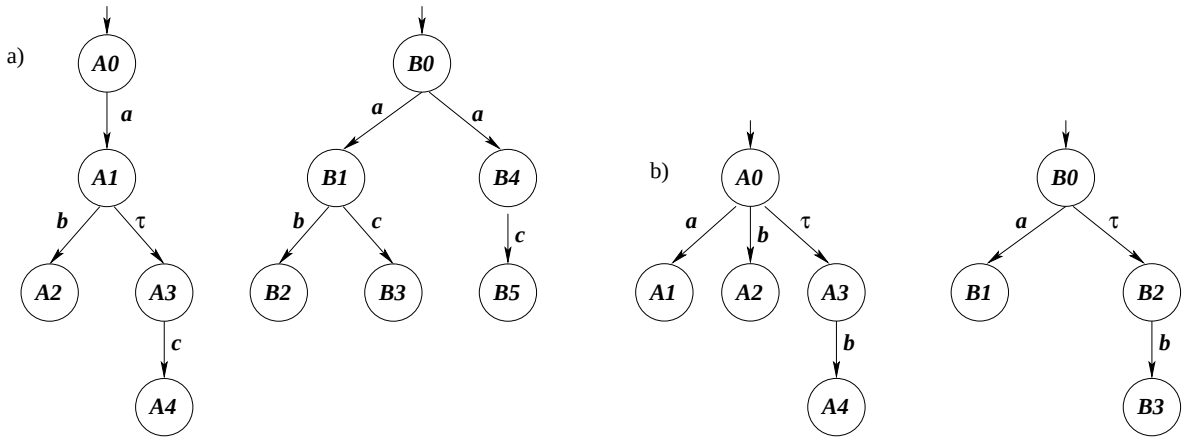
# An Introduction to Specification and Verification

## Exercise 4, Feb. 8th 2008

1. Draw the global state graph of the AB-protocol $S|[d0, d1, a0, a1]|R$ when S and R are following state graphs:

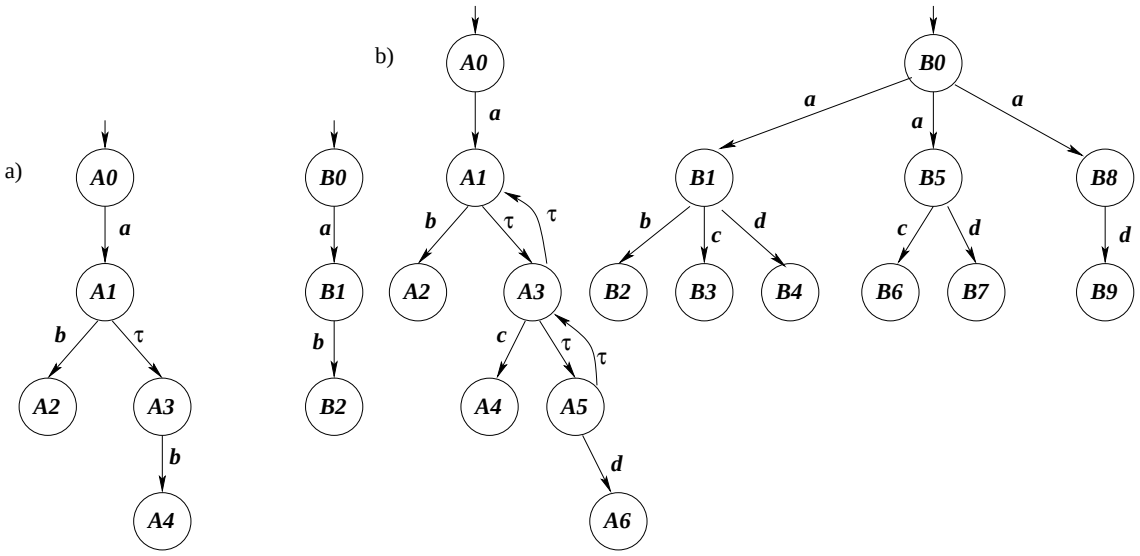



2. Compare the label transition systems given below. Deduce whether the systems are trace-equivalent. Argue closely your conclusions.




3. Compare the label transition systems given above. Deduce whether the systems are weakly bisimilar or not. If the labelled transition systems are weakly bisimilar give the relation and argue closely why it is a weak bisimulation. If the labelled transition systems are not weakly bisimilar argue closely your conclusions.

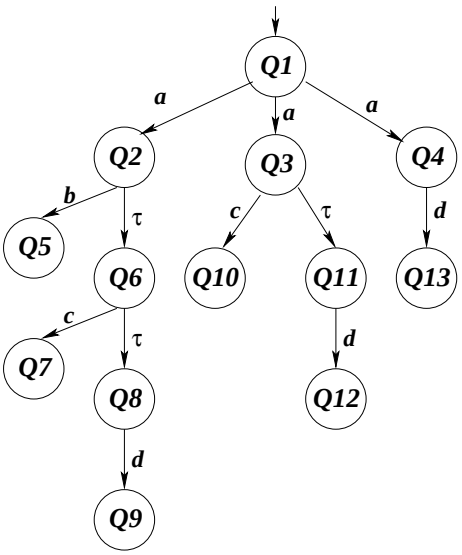
4. Compare the label transition systems given on the next page. Deduce whether the systems are weakly bisimilar or not. If the labelled transition systems are weakly bisimilar give the relation. If the labelled transition systems are not weakly bisimilar argue closely your conclusions.




5. Fernandez has presented an implementation of an efficient algorithm for bisimulation equivalence.

   Using this algorithm to the labelled transition system below, the result will be $\rho = \{\{Q1\}, \{Q2\}, \{Q3, Q6\}, \{Q4, Q8, Q11\}, \{Q5, Q7, Q9, Q10, Q12, Q13\}\}$.

   Draw minimal transition system, which is weakly bisimilar with the original labelled transition system.




6. How the Fernandez's algorithm can be used to compare if $P \approx_{wbis} Q$ ? Use this idea to find out if the prosesses from excercise 2 a) are weakly bisimilar or not. Simulate the algorithm.