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Modeling and Verification of Probabilistic Systems
Summer term 2011

– Series 7 –

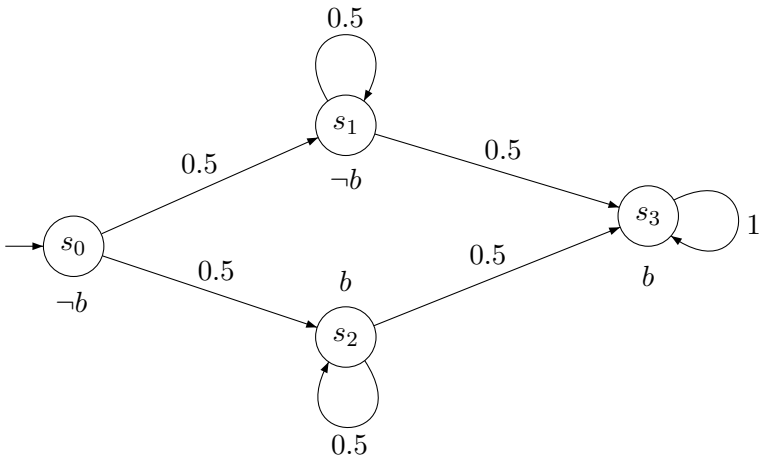
Hand in on 1st June before the exercise class.

Exercise 1 (2 points)

Give a deterministic Rabin automaton (DRA) that accepts the language defined by ω-regular expression $(a+b)^* \cdot a^\omega$.

Exercise 2 (8 points)

For the DTMC give below, find out the probability with which it satisfies the ω-regular property $\Diamond\Box b$ by following steps:



- As the ω-regular property $\Diamond\Box b$ cannot be expressed by deterministic Buchi automata (DBA), give a deterministic Rabin automaton (DRA) that expresses it.
- Give the product of DTMC (in figure) and the DRA in the above set.
- Give the set of all accepting BSCCs in the resultant DTMC.
- Find out the probability of all paths in the resultant DTMC that leads to the set of accepting BSCCs from the initial states.