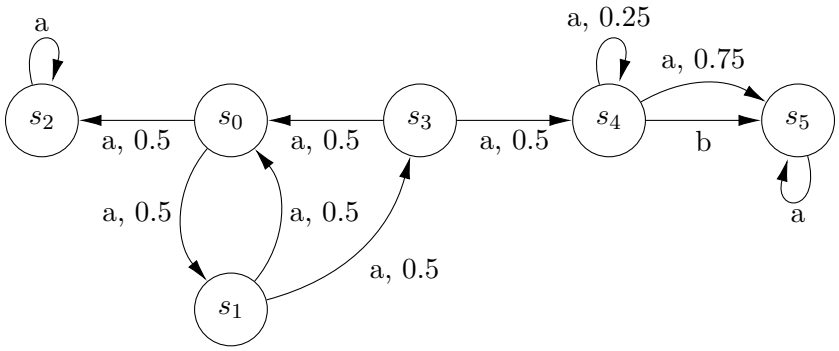
Technische Universität München
Institut für Informatik I07
Theoretical Computer Science

Quantitative Verification 11

Ex 1: Reachability LP

Consider the following MDP.



Write down the reachability LP for $B = \{s_5\}$.

Ex 2: Bounded Reachability

In the lecture, we learned that memoryless schedulers are sufficient for (unbounded) reachability, but not for its bounded counterpart. Try to come up with an MDP where some bounded reachability query can only be maximized by a scheduler with memory. Argue why finite memory is sufficient.

How would you solve a bounded reachability query in general?

Ex 3: Sound Value Iteration

We defined the "stopping criterion" of value iteration as $\max_s |x_{n+1}(s) - x_n(s)| < \varepsilon$ for some small ε. This tends to work in practise, but is not sound in general, i.e. there are some MDP where this property is fulfilled, but the resulting strategy is not optimal. Can you think of such an MDP?