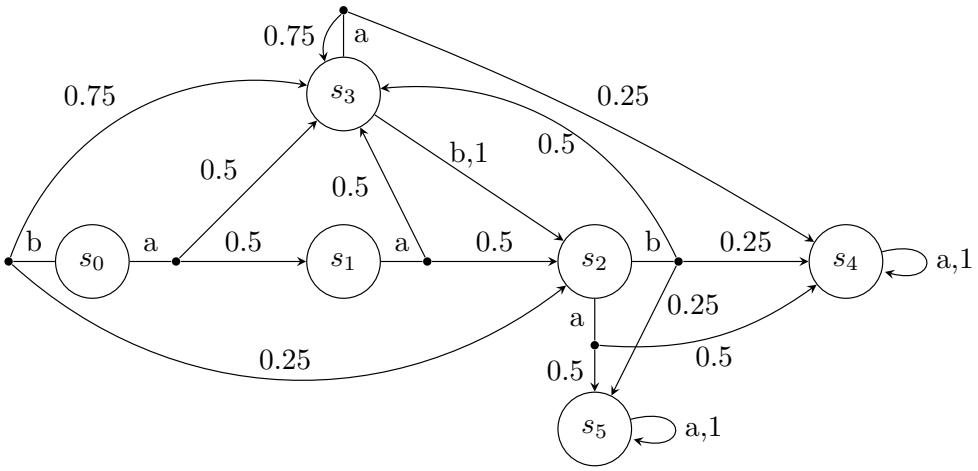
Model Checking: exercise set 6 - MDPs

Due date: March 13

1. Let M be a finite MDP with state space S and initial state s_0. A memoryless randomized scheduler is given by a function $\sigma\colon S \to \mathit{Dist}(\mathit{Act})$. Define the induced DTMC of a memoryless randomized scheduler on an MDP.

2. Consider the MDP M depicted below:



(a) Formulate the LP to compute the probabilities $\Pr^M_{\max}(s \vDash \Diamond\, s_4)$ for all $s \in S$. Simplify this LP as far as possible.

(b) Use value iteration to compute $\Pr^M_{\max}(s \vDash \Diamond\, s_4)$ for all $s \in S$. You may abort the process after 3 iterations.

(c) Use policy iteration to compute $\Pr^M_{\max}(s \vDash \Diamond\, s_4)$ for all $s \in S$. Give the policy that returns this max reachability probability.