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June 17, 2021
Due: June 23, 2021 at noon

Algorithms and Uncertainty

Summer Term 2021

Exercise Set 7

Exercise 1: (4 Points)

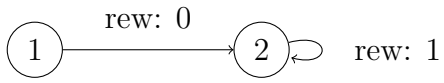
We define a more conservative version of value iteration. It uses the operator T', which is defined by $T'(W) = \eta T(W) + (1-\eta)W$ for an arbitrary $\eta \in (0,1)$. Show that this algorithm also converges to the unique fixed point of T.

Exercise 2: (3+2+2+2 Points)

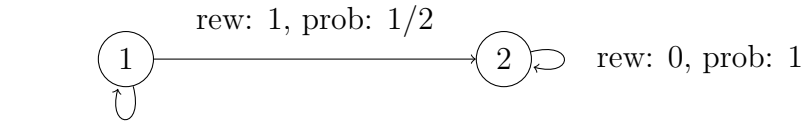
For the following single-armed bandits, give the fair charges of all states. Unless stated otherwise, the transitions are deterministic. Justify your statements if necessary. For part (a), consider $\gamma = \frac{1}{2}$; for the remaining parts an arbitrary $\gamma \in (0,1)$.

(a)

(b)

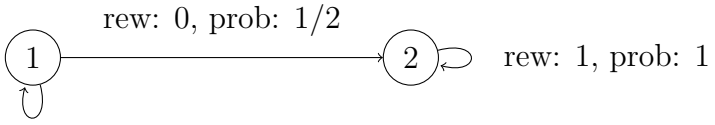


(c)



rew: 1, prob: 1/2

(d)



rew: 0, prob: 1/2