Week 9 Quiz

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Q1

10/10 points (graded)

What are the five essential parameters that define an MDP? Check all that apply:

- [x] state space ✔
- [ ] state model
- [x] action space ✔
- [x] transition model ✔
- [x] starting state ✔
- [ ] action state
- [x] reward distribution ✔

✔

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Answers are displayed within the problem

Q2

10/10 points (graded)

In an MDP with finite state space consisting of n states and finite action space consisting of m actions, what is the dimension of the transition probability matrix?

- ( ) n^3 m

- (selected) n^2 m ✔
- m^2 n
- m*2 n

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Answers are displayed within the problem

Q3

10/10 points (graded)

In an MDP, the transition probability distribution of next state for a given state and action can vary depending on the past history of actions and rewards.

- True
- (selected) False ✔

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Answers are displayed within the problem

Q4

10/10 points (graded)

If you are interested in maximizing long-term rewards, what kind of discount factor should you use?

- close to 0
- (selected) close to 1 ✔
- does not matter

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Answers are displayed within the problem

Q5

10/10 points (graded)

In any MDP, given a discount factor smaller than 1, the optimal discounted reward is same for all starting states.

- ( ) True
- (•) False ✔

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Answers are displayed within the problem

Q6

10/10 points (graded)

A deterministic stationary policy takes the same action (Check all that apply):

- [ ] At all time steps.
- [x] In any given state, for all time steps. ✔
- [x] In any given state and history of actions taken, for all time steps. ✔

✔

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Answers are displayed within the problem

Q7

10/10 points (graded)

For every MDP, there exists a stationary policy whose expected discounted reward for every starting state is at least as good as that of any other policy.

- (•) True ✔
- ( ) False

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Answers are displayed within the problem

Q8

10/10 points (graded)

Bellman optimality equations suggest that in every state, the optimal action to take is the one that maximizes immediate expected reward.

- ( ) True
- (•) False ✔

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Answers are displayed within the problem

Q9

10/10 points (graded)

If the discount factor is 0, then Bellman optimality equations suggest that in every state, the optimal action to take is the one that maximizes immediate expected reward.

- (•) True ✔
- ( ) False

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Answers are displayed within the problem

Q10

10/10 points (graded)

Consider the three state MDP discussed in the lecture, modeling a robot learning to walk (the three states were 'Fallen', 'Standing' and 'Moving'). Suppose now that once the robot has Fallen, no action (fast or slow) can take the robot out of the Fallen state. What will be the transition probability vector for state "Fallen" and action "slow"?

- [1 1 0]
- [1 0 0] ✔
- [1 0 1]
- [0 0 1]
- [0 1 0]

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Answers are displayed within the problem