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Knowledge Checks
Question 1

1/1 point (graded)

Which three statements characterize the difference between supervised learning, unsupervised learning and reinforcement learning?

☑ Supervised learning uses marked or known cases to train an algorithm to predict these cases correctly.

☑ Unsupervised learning attempts to find structure or relationships between cases in a data set without the need for marked cases.

☐ A reinforcement learning agent learns by measuring the error between predictions and known correct results in data cases.

☑ A reinforcement learning agent learns to interact with an environment and attempts to optimize its actions to maximize rewards received.

☐ Reinforcement learning seeks to reduce the dimensionality of the state information by averaging the error between the original state data and the encoding of that data.

✔

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✔ Correct (1/1 point)

Question 2

1/1 point (graded)

Which of the following examples is NOT a suitable reward function for reinforcement learning?

○ A robot must pick up a component and place it in the correct position on a circuit board and receives a reward of 1 if this task is done correctly and -10 if the part is placed incorrectly, or if the robot strikes any of the other components on the circuit board.

○ A tic-tac-to player receives a receives a reward of 1 for winning the game, and no reward for a tie or lost game.

⦿ An agent is trained to drive a car using rules derived from the correct behavior of human drivers.
✔

○ An agent must pick assets for a pension fund which must pay its benefits over time. The agent receives positive rewards for assets that appreciate more than a target return level and negative rewards for assets which do not achieve this performance.

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✔   Correct (1/1 point)

Question 3

1/1 point (graded)

Which three features are absolutely required for a reinforcement learning agent?

☐ A method to mark the time of interactions with the environment.

☑ A way for the agent to sense the state of its environment.

☑ A reward function the agent can use to judge success in the task.

☐ Correctly marked cases to train the agent.

☐ A model of the environment the agent will interact with.

☑ A way for the agent to take actions in the environment.

✔

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✔ Correct (1/1 point)

Question 4

1/1 point (graded)

Which of the following is NOT a component of a reinforcement learning problem?

○ The environment sends the information of reward to the agent.

○ The agent decides to act based on certain policy.

◉ The agent determines which reward it should get based on its action.
✔

○ The environment sends the information of state to the agent.

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✔ Correct (1/1 point)

Question 5

1/1 point (graded)
Which two of the following are good applications for reinforcement learning?

☐ An agent that discovers structure in data to reduce the dimensionality.

☑ Steering a self-driving car, where the reward is positive for arriving at a destination and negative for coming too close to obstacles, other vehicles, edges of driving lanes, or failure to obey traffic rules.

☑ A robot which sells refreshments to people waiting for an airplane flight a reward function that is positive for each person who buys a refreshment and negative for each passenger who does not buy anything.

☐ An inventory management agent that places orders for products that is trained using the history of demand for the products.

✔

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✔ Correct (1/1 point)

Question 6

1/1 point (graded)
Which of the following are differences between episodic tasks and continuing tasks?

○ An episodic tasks run for a fixed number of time steps, whereas continuing tasks proceed for an infinite number of tasks.

○ An episodic task has a terminal state, whereas the continuing task has no terminal state.
✔

○ An episodic task can only run once, whereas a continuing task runs indefinitely.

○ An episodic task receives rewards at the end of each episode, whereas a continuous task can receives rewards at any time.

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✔ Correct (1/1 point)

Question 7

1/1 point (graded)

Which of the following are episodic tasks?

○ Playing a game of chess.

○ An agent for a self-driving car which determines the route for each trip.

○ A robot that places parts on assemblies in a factory.

⊙ All of the above.
✔

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✔ Correct (1/1 point)

Question 8

1/1 point (graded)

Which two of the following definitions of value functions are correct?

☐ A state value function maps the value of a particular action given the state.

☑ A state value function maps the state to the value of being in that state.

☑ A value-state function (action-state function) maps taking a particular action from a state to the value of that action from the state.

☐ A value-state function (action-state function) maps the value of a series of states.

✔

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✔ Correct (1/1 point)

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