Knowledge Checks

Question 1

1.0/1.0 point (graded)

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

- [x] Supervised learning uses marked or known cases to train an algorithm to predict these cases correctly.
- [x] 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.
- [x] 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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Question 2

1.0/1.0 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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Question 3

1.0/1.0 point (graded)

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

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

- [x] A way for the agent to sense the state of its environment.
- [x] 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.
- [x] A way for the agent to take actions in the environment.

✔

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Question 4

1.0/1.0 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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Question 5

1.0/1.0 point (graded)

Which two of the following are good applications for reinforcement learning?

- [ ] An agent that discovers structure in data to reduce the dimensionality.
- [x] 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.
- [x] 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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Question 6

1.0/1.0 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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Question 7

1.0/1.0 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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Question 8

1.0/1.0 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.

- [x] A state value function maps the state to the value of being in that state.
- [x] 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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