Fundamentals of Artificial Intelligence
MOOCs; July - Dec 2024

Assignment No. 9

10 Marks

Each question carries 01 Mark each.

Q1. **Assertion A :** In real-world domains, agents have to deal with both incomplete and incorrect information.
Reason R : Incompleteness arises because the world does not necessarily match the agent's model of it.

A. Both A and R are true and R is the correct explanation for A
B. Both A and R are true but R is not the correct explanation for A
C. A is True but R is False
D. A is false but R is True

Ans: Direct question from Week 9 (Lecture 1) Videos

Q2. _____ provides ways and means of weighing up the desirability of goals and the likelihood of achieving them.

A. Decision Theory
B. Utility Theory
C. Probability Theory
D. Bayesian Networks

Ans: Direct question from Week 9 (Lecture 2) Videos

Q3. _____ provides a general, concise representation for large POMDP, so they can be used as inputs for any POMDP algorithm including value and policy iteration methods.

A. Bayesian Networks
B. Decision Networks
C. Dynamic Decision Networks
D. Dynamic Belief Networks

Ans: Direct question from Week 9 (Lecture 3) Videos

Q4. STRIPS is an alternative representation to the pure situation calculus for planning.
I. Hierarchical Plans cannot be expressed in STRIPS.
II. STRIPS operators are essentially propositional.
III. Real world projects need a better model of time than that in STRIPS.
Which of the above statements are correct?

A. Only Statements I and II
B. Statements I, II and III
C. Only Statements II and III
D. None.

Ans: Direct question from Week 9 (Lecture 1) Videos

Q5. A Markov Decision Process is a four tuple <S, A, T, R>, where S is the finite set of states, A is the finite set of actions and R is the cost or reward being in state s. T is the transition model which specifies.

A. Probability of executing action a in state s at time t
B. Probability of s′ at time t+1, given action a in state s at time t.
C. Probability of s at time t, given actions in states upto time t-1
D. Probability of executing action a in state s′ at time t+1

Ans: Question based on Week 9 (Lecture 2) Videos

Q6. Sequential decision problems, which include utilities, uncertainty, and sensing, generalize the search and planning problems. Transition model refers to the following:
A. Set of probabilities associated with the possible transitions between states after any given action.
B. A complete mapping from states to actions.
C. Function be specified for the agent in order to determine the value of an action.
D. Specification of the outcome probabilities for each action in each possible state.

Ans: Question based on Week 9 (Lecture 2) Videos

Q7. Value Iteration is an algorithm for computing an optimal policy. The basic idea includes
A. Computing the utility of each state.
B. Use state utilities to select an optimal action in each state.
C. Calculate a new Maximum Expected Utility policy based on computed utilities.
D. Start with a random policy and calculate utilities based on if that policy were executed.

Q8. **Assertion A :** In complex real-world projects, it is common to use scheduling tools from Operations Research.
Reason R : Scheduling tools essentially take a hand constructed complete partial-order plan and generate an optimal schedule for it.

A. Both A and R are true and R is the correct explanation for A
B. Both A and R are true but R is not the correct explanation for A
C. A is True but R is False
D. A is false but R is True

Ans: Question based on Week 9 (Lecture 2) Videos

Q9. Policy Iteration is an alternate algorithm for computing an optimal policy. The basic idea includes
A. Computing the utility of each state.
B. Use state utilities to select an optimal action in each state.
C. Calculate a new Maximum Expected Utility policy based on computed utilities.
D. Start with a random policy and calculate utilities based on if that policy were executed.

Ans: Question based on Week 9 (Lecture 3) Videos

Q10. **Assertion A :** The sensor model in a belief network is the Conditional Probability Table (CPT) associated with the percept node.

Reason R : If the sensor gives a perfect report of the state, then the sensor model (the CPT) will be purely deterministic.

A. Both A and R are true and R is the correct explanation for A
B. Both A and R are true but R is not the correct explanation for A
C. A is True but R is False
D. A is false but R is True

Ans: Question based on Week 9 (Lecture 3) Videos