

Unit 14 - Week 11

Course outline

How does an NPTEL online course work?

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Week 7

(Optional) Knowledge Structures

Week 8

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Week 11

- Default Logic
- Autoepistemic Logic
- Epistemic Logic
- The Muddy Children Puzzle
- Quiz : Assingment 11

Artificial Intelligence: Knowledge Representation And Reasoning: Week 11 Feedback form

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Assingment 11

The due date for submitting this assignment has passed.
As per our records you have not submitted this assignment.

Due on 2020-04-15, 23:59 IST.

1) The need for Default Reasoning arises because 1 point

- we need a mechanism to make the same inferences again and again repeatedly
- reasoning about actions in classical logic is hard
- some inferences need to be made before others
- universal statements like "all students are young" are rarely true and we still need to express such knowledge

No, the answer is incorrect.
Score: 0

Accepted Answers:
universal statements like "all students are young" are rarely true and we still need to express such knowledge

2) Default reasoning is also called non-monotonic reasoning because 1 point

- in some domains the data is not reliable and can be noisy
- the set of inferred statements does not grow monotonically with increasing facts
- a default inference may have to be withdrawn if more data becomes available
- sometime a rule fires and sometimes it doesn't

No, the answer is incorrect.
Score: 0

Accepted Answers:
the set of inferred statements does not grow monotonically with increasing facts
a default inference may have to be withdrawn if more data becomes available

3) Minimization of a predicate in the context of default reasoning means 1 point

- minimizing the number of elements in the interpretation of that predicate
- saying that only those instances of the predicate are true that are entailed by the KB
- minimizing the use of that predicate in formulas of the KB
- none of the above

No, the answer is incorrect.
Score: 0

Accepted Answers:
minimizing the number of elements in the interpretation of that predicate
saying that only those instances of the predicate are true that are entailed by the KB

4) Mark all the TRUE statements relating to default reasoning? 1 point

- Closed World Reasoning, Circumscription, Default logic, Auto epistemic logic are approaches that implement default reasoning
- Default logic and Auto epistemic logic implement default reasoning but Closed World Reasoning and Circumscription cannot
- In default logic, even though use default rules, we cannot treat them like logic formulas and reason about them
- Autoepistemic Logic expresses default rules as sentences in FOL augmented with the modal operator Believes (B)

No, the answer is incorrect.
Score: 0

Accepted Answers:
Closed World Reasoning, Circumscription, Default logic, Auto epistemic logic are approaches that implement default reasoning
In default logic, even though use default rules, we cannot treat them like logic formulas and reason about them
Autoepistemic Logic expresses default rules as sentences in FOL augmented with the modal operator Believes (B)

5) Choose the true statement(s) 1 point

- In circumscription, we minimize all the predicates
- In circumscription, we minimize only the abnormal/chosen predicates
- In circumscription, we provide a mechanism for specifying explicitly which statements should be added to the KB when it is consistent to do so
- In CWA, we minimize all the predicates
- In CWA, we minimize only the abnormal/chosen predicates
- In CWA, we provide a mechanism for specifying explicitly which statements should be added to the KB when it is consistent to do so
- In default logic, we minimize all the predicates
- In default logic, we minimize only the abnormal predicates
- In default logic, we provide a mechanism for specifying explicitly which statements should be added to the KB when it is consistent to do so

No, the answer is incorrect.
Score: 0

Accepted Answers:
In circumscription, we minimize only the abnormal/chosen predicates
In CWA, we minimize all the predicates
In default logic, we provide a mechanism for specifying explicitly which statements should be added to the KB when it is consistent to do so

6) Which of the following statements are true with respect to the following default rule 1 point

<Bird(tweety): Flies(tweety)/Flies(tweety)>

- If we know that Tweety is a bird, then we should conclude that Tweety flies if it is consistent to assume that Tweety flies
- It can be written as a normal rule: Flies(tweety) \supset Bird(tweety)
- Flies(tweety) is consistent if \neg Flies(tweety) does not belong to the extension
- An extension is a set of plausible beliefs that can be held by a reasoned
- It cannot be called a normal rule as the prerequisite, conclusion and justification should be different from each other

No, the answer is incorrect.
Score: 0

Accepted Answers:
If we know that Tweety is a bird, then we should conclude that Tweety flies if it is consistent to assume that Tweety flies
Flies(tweety) is consistent if \neg Flies(tweety) does not belong to the extension
An extension is a set of plausible beliefs that can be held by a reasoned

7) We have the following default theory <F,D> where 1 point

F = { Politician(tim), Politician(sam), \neg Graduate(tim), Graduate(sam), \neg Dishonest(sam) }
D = { Politician(x) \supset Dishonest(x) }

What are the possible extensions?

- { Politician(tim), Politician(sam), Graduate(tim), Graduate(sam), \neg Dishonest(sam) }
- { Politician(tim), Politician(sam), \neg Graduate(tim), Graduate(sam), Dishonest(tim) }
- { Politician(tim), Politician(sam), \neg Graduate(tim), Graduate(sam), \neg Dishonest(sam), Dishonest(tim) }
- { Politician(tim), Politician(sam), Graduate(tim), Graduate(sam), \neg Dishonest(sam), \neg Dishonest(tim) }

No, the answer is incorrect.
Score: 0

Accepted Answers:
{ Politician(tim), Politician(sam), \neg Graduate(tim), Graduate(sam), \neg Dishonest(sam), Dishonest(tim) }

8) What are the stable sets in the previous question? 1 point

- F \cup { Dishonest(sam) }
- F \cup { Dishonest(sam), Dishonest(tim) }
- F \cup { Dishonest(tim) }
- None of the above

No, the answer is incorrect.
Score: 0

Accepted Answers:
F \cup { Dishonest(tim) }

9) In autoepistemic logic 1 point

- The default assumptions are usually of the form $\neg B \rightarrow a$.
- The default assumptions are of the form Ba
- The new default beliefs about the world can be deduced from the default assumptions
- There is no notion of entailment using default assumptions

No, the answer is incorrect.
Score: 0

Accepted Answers:
The default assumptions are usually of the form $\neg B \rightarrow a$.
The new default beliefs about the world can be deduced from the default assumptions

10) An edge in the graphical representation of a Kripke structure is labelled by _____ and signifies that _____ 1 point

- an agent, both the possible worlds linked by the edge are indistinguishable by that agent
- a world, both the agents consider the world possible
- a proposition, the proposition is true in both the possible worlds
- a proposition, the proposition is false in both the possible worlds

No, the answer is incorrect.
Score: 0

Accepted Answers:
an agent, both the possible worlds linked by the edge are indistinguishable by that agent

BEGIN GROUP (1)

Four players Ashika, Bindu, Chameli, Devika (referred to by A, B, C and D respectively) are playing a game of bridge. Each person can see only their own cards, but not the cards of the other players. Let X_{card} stand for the fact that "player X holds card" and let $K_y P$ denote the statement that "player Y knows statement P"

11) Given the statements (A–D) below, identify the formulas (1–4) that represent them: 1 point

- A. Ashika knows that Chameli holds the jack of hearts (HJ)
- B. Ashika knows Bindu does not know who holds the jack of hearts (HJ)
- C. Bindu knows she does not hold the jack of hearts (HJ)
- D. Bindu knows one of Ashika and Chameli hold the jack of hearts (HJ)

- 1. $K_A \neg (K_B A_{HJ} \vee K_B B_{HJ} \vee K_B C_{HJ} \vee K_B D_{HJ})$
- 2. $K_B \neg B_{HJ}$
- 3. $K_B (A_{HJ} \vee C_{HJ})$
- 4. $K_A C_{HJ}$

- A-1, B-2, C-3, D-4
- A-2, B-1, C-3, D-4
- A-2, B-3, C-4, D-1
- A-4, B-1, C-2, D-3
- A-3, B-4, C-1, D-2

No, the answer is incorrect.
Score: 0

Accepted Answers:
A-4, B-1, C-2, D-3

12) Chameli actually holds the king of spades (SK) in the game being played. Devika announces to everyone that she does not hold the king of spades. 1 point

Which of the following statements are true?

- $K_B \neg D_{SK}$
- $K_B \neg C_{SK}$
- $K_B C_{SK}$
- $K_A K_B \neg B_{SK}$
- $K_C \neg K_A \neg B_{SK} \wedge K_C \neg K_A \neg C_{SK} \wedge K_C \neg K_A \neg D_{SK}$
- $K_B (C_{SK} \vee A_{SK})$

No, the answer is incorrect.
Score: 0

Accepted Answers:
 $K_B \neg D_{SK}$
 $K_B (C_{SK} \vee A_{SK})$

END GROUP (1)

13) Given the following KB: 1 point

{ Politician(tim),
Politician(sam),
(tim \neq sam),
 \neg Dishonest(tim),
 $\forall x [(\text{Politician}(x) \wedge \neg B \rightarrow \text{Dishonest}(x)) \supset \text{Dishonest}(x)]$ }

What statements(s) are entailed under Circumscription?

- Dishonest(tim)
- \neg Dishonest(tim)
- Dishonest(sam)
- \neg Dishonest(sam)

No, the answer is incorrect.
Score: 0

Accepted Answers:
 \neg Dishonest(tim)
Dishonest(sam)