Odpovědník Exam-18-12

Odpovědi k průchodu Út 17. 12. 2013 13:54.34, operaci St 18. 12. 2013 12:42.44, osobě M. Ziman, učo 373840 (číslo zadání: 18)

• Klikněte: Ukaž Přehled nastavení parametrů odpovědníku.

Přehled nastavení parametrů odpovědníku

Kdy lze s odpovědníkem pracovat:

- od 18. 12. 2013 08:00 do 18. 12. 2013 09:30

Zobrazují se pouze správné odpovědi: ne
Test můžu skládat opakovaně: test nelze skládat, je přístupná pouze prohlídka (typicky skenovací písemky)
Implicitní počet bodů za správně zodpovězenou otázku (ok): 1
Implicitní počet bodů za špatně zodpovězenou otázku (nok): -0.5
Implicitní počet bodů za nezodpovězenou otázku (null): -0.25
Při vyplňování záleží na velikosti písmen: ne
Při vyplňování záleží na diakritice: ne
Při vyplňování nedovoluji zaměnit různé typy apostrofů a uvozovek: ne
Při vyplňování záleží na interpunkci: ne

Zeleně jsou vyznačeny správné odpovědi.

1. Transformation of a predicate formula into Skolem normal form preserves
   - ◯ equivalence
   - ◉ ✓ *satisfiability
   - ◯ neither satisfiability nor equivalence

   body = ok = 1

2. **(2 points)**
   How many steps are necessary to specialize the clause $p(X,W) :- q(X,Y), r(Z,W).$ to the clause $p(a,b) :- q(a,Y), r(Z,b), s(Y,Y).$?
   - ◯ seven
   - ◯ six
   - ◉ ✓ *five

   body = 2 = 2

3. For propositional logic, linear input resolution is
   - ◉ ✓ *sound but not complete
   - ◯ not sound but complete
   - ◯ sound and complete

   body = ok = 1

4. Let F, a formal system for propositional logic, be given. Let `T` be a set of all theorems that can be derived in F, `V` a set of all well-formed formulas of propositional logic and `P` a set of all tautologies. Which of the following statements is true?
   - ◉ ✓ *if F si correct then `T` $\subseteq$ `P`
   - ◯ if F is complete then `T = V`
   - ◯ if F is contradictory then `T = P`

body = ok = 1

5. There exists a noncontradictory path in a finished tableau with the root $\mathrm{F}\mathcal{A}$ for a propositional formula $\mathcal{A}$. Then
   - ◉ ✔ * $\mathcal{A}$ is false at least in one interpretation
   - ○ $\mathcal{A}$ is false in every interpretation
   - ○ $\mathcal{A}$ is true at least in one interpretation

body = ok = 1

6. Transformation of a predicate formula into prenex normal form preserves
   - ○ equivalence but not satisfiability
   - ◉ ✔ *both satisfiability and equivalence
   - ○ satisfiability but not equivalence

body = ok = 1

7. Given F, a formal system for propositional logic, let `T` be a set of all theorems that can be derived in F, `V` a set of all well-formed formulas of propositional logic and `P` a set of all tautologies. Which of the following statements is true?
   - ○ if F is correct then `P = T`
   - ○ *if F is contradictory then `T = V`
   - ◉ ✘ if F is complete then `P` $\subset$ `T`

body = nok = -0.5

8. In 5-valued Lukasiewicz logic with truth values {0, 0.25, 0.5, 0.75, 1},given val(p)=1 and val(q)=0, then val(p $\wedge\neg$ q) is
   - ○ 0.5
   - ◉ ✔ *1
   - ○ 0

body = ok = 1

9. Which of the sets contain all of its mutually nonequivalent logical consequences (with only proposition symbols from premises)?
   - ○ $\{p \vee \neg p, q \vee \neg q, q \vee q\}$
   - ◉ ✘ $\{p \vee \neg q, q \vee p, (p \vee \neg q) \wedge (q \vee \neg p)\}$
   - ○ * $\{p \vee \neg p, q \vee \neg q, q \Rightarrow q\}$

body = nok = -0.5

10. We know that a finished contradictory tableau for $\mathrm{F}w \Vdash \varphi$ exists. Which of the following statements is true?
    - ○ φ is not true at least in one world of at least one Kripke frame
    - ○ φ is not true at least in one world of each Kripke frame.
    - ◉ ✔ * φ is true in all worlds of all Kripke frames.

body = ok = 1

11. For Horn clauses, SLD-resolution is
    - ○ *sound and complete
    - ◉ ✘ sound and not complete
    - ○ not sound but complete

body = nok = -0.5

12. **(2 points)**
    Build a DCG grammar for the recognition and evaluation of binary numbers which returns a decimal value for every correct input, e.g.
    `?- b(X,[1,1,0],[]). X=6 Yes`
    Every nonempty list of ones and zeroes is supposed to be a correct representation of a binary number.
    The beginning of the grammar is
    `c(0)--> [0]. c(1)--> [1]. b(X)--> b(0,X).`
    What is the correct choice for rest of the grammar?
    - ○ *`b(X,Y)--> c(Z), {Y is 2*X + Z}.`
      `b(X,Y)--> c(Z), {X1 is 2*X + Z}, b(X1,Y).`
    - ○ `b(X,Y)--> c(Z), {X1 is 2*X + Z}, b(X1,Y).`

◉ ✗ `b(X,X)--> [].`
`b(X,Y)--> b(X,Y1), {Y is 2*Y1 + Z}, c(Z).`

body = -1 = -1

13. Which of the following is the specialization operator?
   - ○ removal of a literal from a clause body
   - ○ changing the order of literals in a clause body
   - ◉ ✓ *addition of a literal into a clause body

body = ok = 1

14. A tableau for a propositional formula containing an infinite path
   - ◉ ✓ *does not exist
   - ○ can be finished
   - ○ is always finished

body = ok = 1

15. In Box model, the EXIT port of one box is connected to
   - ○ the REDO port of the following box
   - ◉ ✓ *the CALL port of the following box
   - ○ the FAIL port of the previous box

body = ok = 1

16. There is a tableau (not yet finished) with nodes $wSv, vSu, Tv \Vdash \varphi(c)$, among others.
   Without any further assumptions we can use the constant c in next reductions only in nodes that concern world(s)
   - ○ v, w but not u
   - ◉ ✓ *u, v but not w
   - ○ all u, v and w

body = ok = 1

17. Which of the following clauses is not a specialization of the clause $p(X, Y) : -q(X, Z), r(Z, f(Y)).$?
   - ○ $p(f(X), Y) : -q(f(X), Z), r(Z, f(Y)), p(Z, f(Z)).$
   - ○ $p(X, f(c)) : -q(X, b), r(b, f(f(c))), p(c, Y).$
   - ◉ ✓ *$p(X, X) : -q(X, X), r(X, f(c)), s.$

body = ok = 1

18. In fuzzy logic, given val(p)=1, val(q)=0.5, val(r)=0.2, then
   val($\neg$ (p $\Rightarrow$ q) $\vee$ r) is
   - ◉ ✓ *0.5
   - ○ 1
   - ○ 0

body = ok = 1

19. The minimal generalization of atoms $p(a, X, c)$ and $p(a, X, d)$ is
   - ◉ ✓ *$p(a, X, Y)$
   - ○ $p(Z, X, Y)$
   - ○ $p(a, b, c)$

body = ok = 1

20. Suppose F is a given formal system for propositional logic. Let `T` be a set of all theorems that can be derived in F, `V` a set of all well-formed formulas of propositional logic and `P` a set of all tautologies. Which of the following statements is true?
   - ○ if F is contradictory then `P = V`
   - ◉ ✓ *if F is sound and complete then `P = T`
   - ○ if F is not contradictory then `T = V`

body = ok = 1

21. For a Prolog program p(X) :- p(Y). p(a). p(b). p(c). and a goal ?- p(Z). it is true :

◯The program is looping, the output is Z=a

◉ ✔ *The program is looping, there is no output.

◯The program is looping, the output is Z=a ; Z=b ; Z=c ; no

body = ok = 1

22. For the formulas $p \Leftarrow (a \wedge c)$ and $p \Leftarrow (a \wedge c \wedge d)$, where p, a, b, c, d are propositional letters, it holds that

◯$p \Leftarrow (a \wedge c \wedge d)$ is a generalization of the formula $p \Leftarrow (a \wedge c)$

◯the formulas are not in generalization relation

◉ ✔ *$p \Leftarrow (a \wedge c)$ is a generalization of the formula $p \Leftarrow (a \wedge c \wedge d)$

body = ok = 1

23. Let P be a predicate formula which is neither a contradiction nor a tautology. Then

◯there is exactly one formula in prenex conjunctive normal form equivalent to P

◉ ✔ *there is at least one formula in prenex conjunctive normal form equivalent to P

◯it is possible that a formula in prenex conjunctive normal form equivalent to P does not exist

body = ok = 1

24. **(2 points)**
Suppose we have the following Prolog code:

```
prove(true).
prove((A,B)):- prove(A), prove(B).
built_in(clause(_,_)).
```

To obtain a metainterpreter that can interpret *itself* it is necessary to

◯*add the clauses

```
prove(A):- clause(A,B), prove(B).
prove(A):- built_in(A), A.
```

◉ ✘ add the clauses `prove(A):- built_in(A), A.`
`prove(A):- clause(A,B), prove(B).` and remove the clause `prove(true).`

◯add the clauses `prove(A):- A.`
`prove(A):- clause(A,B), prove(B).` and remove the clause `built_in(clause(_,_)).`

body = -1 = -1

25. Suppose q is interpreted as true. Then the formula $p \Rightarrow q$ is

◯false

◉ ✔ *true

◯true or false depending on the interpretation of p

body = ok = 1

26. There exists a tableau proof for a propositional formula A.
Which statement is true?

◯A is true only in one interpretation

◉ ✔ *A is true in every interpretation

◯A is a contradiction

body = ok = 1

27. Which is **not** a functionally complete set of connectives?

◉ ✔ *$\{ \neg, \Leftrightarrow \}$

◯$\{ \neg, \Rightarrow \}$

◯$\{ \neg, \vee \}$

body = ok = 1

28. Let $P(Adam, Eve, apple)$ represent the statement, *Adam gives Eve an apple*. Which of the formulas represents the statement equivalent to *someone gives Eve an apple and Eve gives nothing to anyone*?

◯$\exists x P(x, Eve, apple) \wedge \exists y \exists z \neg P(Eve, y, z)$

◉ ✔ *$\exists x P(x, Eve, apple) \wedge \neg(\exists y \exists z P(Eve, y, z))$

◯$\exists x P(Eve, x, apple) \wedge \exists y \neg(\exists z P(Eve, y, z))$

body = ok = 1

29. Backward chaining is
   - ◯an inference method which starts with the available data (list of facts)
   - ◉ ✔ *an inference method which starts with a hypothesis (list of goals)
   - ◯a refinement of SLD resolution

body = ok = 1

30. In description logic $\mathcal{ALCN}$ for the domain that contain only persons, with concepts `Man`, `Woman` and a role `hasChild` is the definition of the concept `FatherOfManyChildren` ("men that have at least 4 children")
   - ◉ ✔ *$\texttt{FatherOfManyChildren} \equiv \texttt{Man} \sqcap \geq 4\ \texttt{hasChild}$
   - ◯$\texttt{FatherOfManyChildren} \equiv \exists \texttt{Man.hasChild} \geq 4$
   - ◯$\texttt{FatherOfManyChildren} \equiv\ \geq 4\ \texttt{hasChild.Man}$

body = ok = 1

31. For an SLD-tree, it is true that
   - ◉ ✔ *it may contain an infinite branch
   - ◯it contains finitely many nodes
   - ◯it contains at least one finite branch

body = ok = 1

32. **(2 points)**
   How many steps are necessary to specialize the clause $p(X, W) : -q(X, Y), r(Z, W)$. to the clause $p(a, b) : -q(a, Y), r(Y, b), s(Y, Y)$.?
   - ◯seven
   - ◉ ✔ *six
   - ◯five

body = 2 = 2

33. Suppose B is a domain knowledge, H is a resulting theory and E^+, E^- are sets of positive and negative examples. Then *posterior satisfiability* in inductive logic programming represents the condition
   - ◯$\forall e \in E^+ : B \cup H \vdash e$
   - ◯$\forall e \in E^- : B \nvdash e$
   - ◉ ✔ *$\forall e \in E^- : B \cup H \nvdash e$

body = ok = 1

34. By processing of a negative example the algorithm for the version space computation
   - ◉ ✘ always removes one of the most specific formulas from the set S.
   - ◯always removes one of the most general formulas from the set G.
   - ◯*can remove one of the most general formulas from the set G.

body = nok = -0.5

35. **(2 points)**
   A modal tableau proof of the formula $\Box\Box\psi \vee \Diamond\neg\psi$ proves that the formula is not a tautology and gives the following Kripke frame $(W, S, C(w)_{w\in W})$ as an counterexample (except for variable naming) where:
   - ◉ ✔ *$W = \{p, q, r\}, S = \{(p, q), (q, r)\}, \psi$ is true in q, ψ is not true in r
   - ◯$W = \{p, q\}, S = \{(p, q), (q, p)\}, \psi$ is true in q, ψ is not true in p
   - ◯$W = \{p, q, r\}, S = \{(p, q), (p, r)\}, \psi$ is true in r, q, ψ is not true in p

body = 2 = 2

Celkem bodů: 28 (z maximálních 40) (celkem otázek: 35, z toho špatně 6, nezodpovězených 0)

- [Zpět na výběr operace]()

Bez uložení:

- [Zpět na výběr odpovědníku]()