338.001, VL Logic, Martina Seidl / Wolfgang Schreiner / Wolfgang Windsteiger, 2022W

Quiz navigation

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Finish review

Started on	Thursday, 15 December 2022, 9:52 PM
State	Finished
Completed on	Thursday, 15 December 2022, 10:07 PM
Time taken	14 mins 46 secs
Grade	**0.9** out of 1.0 (**89**%)

Question 1

Partially correct

Mark 0.1 out of 0.2

Flag question

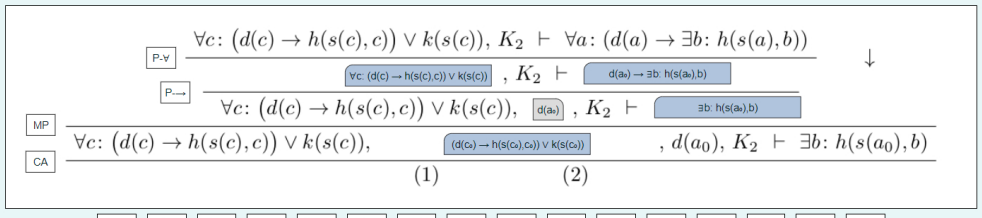
In the following questions, you need to generate a formal proof (proof tree) of the statement $(K_1 \wedge K_2) \rightarrow G$, where K_1, K_2, and G abbreviate the following formulas:

$$K_1: \forall c\colon (d(c) \rightarrow h(s(c),c)) \vee k(s(c))$$
$$K_2: \forall b\colon (k(b) \rightarrow \exists c\colon h(b,t(c)))$$
$$G: \forall a\colon (d(a) \rightarrow \exists b\colon h(s(a),b))$$

Note that, for reasons of space, we will sometimes use the abbreviations instead of the expanded formulas even in the proof tree.

In the first exercise, develop an "incomplete" proof tree until the step, where the proof divides into 2 branches called (1) and (2). These branches (1) and (2) have then to be completed in the subsequent exercises.

Like in the other examples, proof rule "GA" stands for "GoalAssum" and "CA" stands for "ContrAssum".



A-⟶ CA A-∀ P-∃ P-∨ P-∀ MP A-∃ P-∧ A-¬ A-∧ GA A-∨ P-¬ P-⟶ P-↔

d(a₀) ∧ ∃b: h(s(a₀),b) | (d(a₀) → h(s(a₀),a₀)) ∨ k(s(a₀)) | ∃b: h(s(a₀),b) | d(a₀) → ∃b: h(s(b),a₀)

d(a₀) → h(s(a₀),b₀) | ∀c: (d(c) → h(s(c),c)) ∨ k(s(c)) | ∃b: h(s(c₀),b) | (d(c₀) → h(s(c₀),c₀)) ∨ k(s(c₀))

∀a: (d(a) → ∃b: h(s(a),b)) | d(a₀) ∧ ∃b: h(s(b),a₀) | d(a₀) → ∃b: h(s(a₀),b)

d(c₀) | d(a) | k(a₀) | h(a₀) | s(c) | s(a₀)

Die Antwort ist teilweise richtig.

You have correctly selected 6.

Question 2

Partially correct

Mark 0.3 out of 0.3

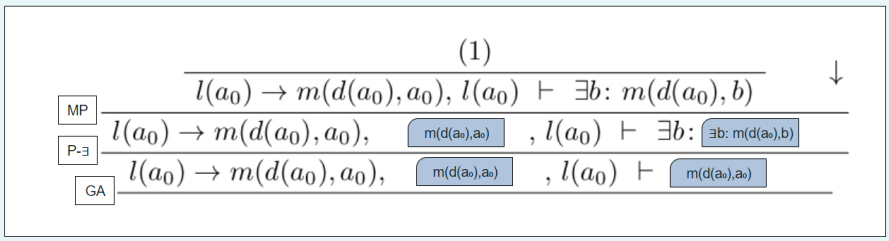
Flag question

Suppose now the proof situation in branch (1) is

$$l(a_0) \rightarrow m(d(a_0),a_0), l(a_0) \vdash \exists b\colon m(d(a_0),b).$$

Note that this might not be exactly what you derived in the first example, it is a "hypothetical" proof situation. Complete **this branch** of the proof.

Like in the other examples, proof rule "GA" stands for "GoalAssum" and "CA" stands for "ContrAssum".



P-∀ A-∀ A-¬ A-∧ CA GA MP P-↔ P-∧ A-⟶ P-¬ P-∃ P-∨ A-∃ P-⟶ A-∨

m(d(a₀),b) | ∃b: m(d(a₀),b) | ⊥ | ∀b: m(d(a₀),b) | m(a₀,d(a₀)) | m(d(a₀),b₀) | m(d(a₀),a₀) | m(b,d(a₀))

Die Antwort ist teilweise richtig.

You have correctly selected 6.

Question 3

Correct

Suppose now the proof situation in branch (2) is

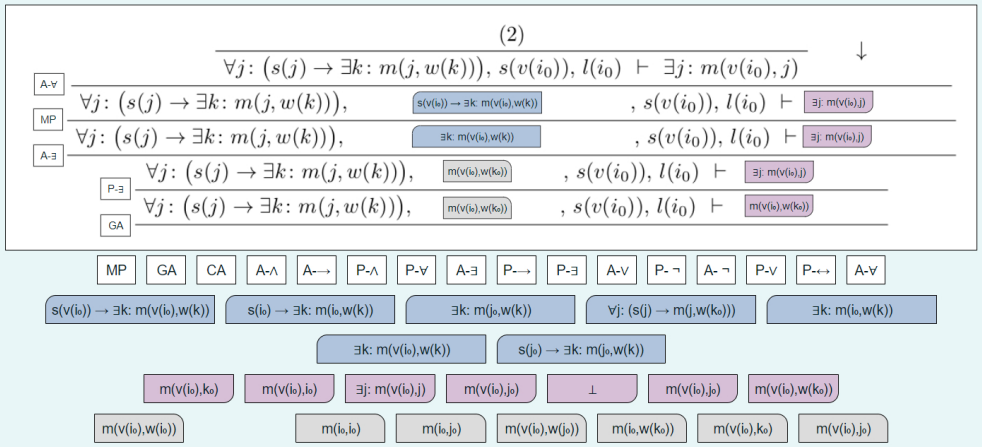
Mark 0.5 out of 0.5

Flag question

$\forall j\colon (s(j) \to \exists k\colon m(j,w(k))), s(v(i_0)), l(i_0) \vdash \exists j\colon m(v(i_0),j)$

Note that this might not be exactly what you derived in the first example, it is a "hypothetical" proof situation. Complete **this branch** of the proof.

Like in the other examples, proof rule "GA" stands for "GoalAssum" and "CA" stands for "ContrAssum".



Die Antwort ist richtig.

Finish review

◄ FOB2Q

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FOB3B ►