

Übungen zur Modellierung, Wintersemester 2006/07

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Sprechstunde abwechselnd Montag, 15-16 Uhr

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Übungsblatt 2

Abgabe bis **02.11.2006, 14:00 Uhr**

English version, without any warranty (German version counts)!

Aufgabe 3: Logic

Describe the following terms in your own words:

- Syntax
- Semantics
- Representation
- Presentation
- Interpretation

How do the terms above correlate to each other?

6 Punkte

Aufgabe 4: Semantic equivalence

Given: a set of elementary statements \mathcal{A} , as well as the set of the formable boolean terms $T_{\mathcal{A}}$.

Prove that for each boolean term T of $T_{\mathcal{A}}$ applies:

- (a) $T \wedge \neg T \equiv 0$
- (b) $T \vee \neg T \equiv 1$
- (c) $0 \wedge T \equiv 0$
- (d) $1 \wedge T \equiv T$

8 Punkte

Aufgabe 5: Syntactic and semantic level

The set of elementary statements $\mathcal{A} = \{A, B, C\}$ and the following Boolean terms are given:

$$T_1 := (A \wedge B) \rightarrow C$$

$$T_2 := (A \rightarrow B) \rightarrow (A \rightarrow C)$$

Show the semantic equivalence of T_1 and T_2 on \mathcal{A}

- (a) on syntactical level (by term conversions, like in the script with arguments/explanations for the individual steps)
- (b) on the semantic level (through truth tables)

Hint:

Besides the semantic equivalences reported in the script you can also use those of exercise 4 and the equivalences $1 \vee T \equiv 1$ and $0 \vee T \equiv T$. 6 Punkte