

**Exercise for the lecture Modeling Methods in Computer Science,
Winter Semester 2007/08**

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Consultation-hour: Thursday, 15:00-16:00

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Exercise Sheet 3Due date: **07.11.2007, 14:00 Uhr**

Exercise 5: Horn Formulae

Convert the following formulae to their conjunctive normal form (document your approach!).

Are the resulting formulae Horn formulae?

If that is not the case, explain why.

- (a) $(A \vee B) \rightarrow (A \wedge B)$
- (b) $(A \wedge B) \rightarrow (A \vee B)$
- (c) $((A \vee B) \rightarrow C) \rightarrow ((A \rightarrow C) \wedge (B \rightarrow C))$
- (d) $\neg(A \wedge B \wedge C) \wedge (\neg A \vee B \vee \neg C)$

10 Points

Exercise 6: Marking Algorithm

Given the alphabet $\mathcal{A} := \{A, B, C, D, E\}$:

Apply the marking algorithm to the following formulae and specify all intermediate steps.

Are the formulae satisfiable or not?

If a formula is satisfiable, also give a minimal model.

- (a) $F_1 := A \wedge (\neg B \vee \neg C \vee \neg A) \wedge (C \vee \neg D) \wedge (B \vee \neg C \vee \neg A) \wedge C$
- (b) $F_2 := (\neg A \vee B \vee \neg C) \wedge (C \vee \neg D) \wedge (E \vee \neg A \vee \neg C) \wedge (A \vee \neg C) \wedge C$

10 Points