TECHNISCHE UNIVERSITÄT DRESDEN

Faculty of Computer Science Institute of Theoretical Computer Science, Chair of Automata Theory

Nonmonotonic Reasoning

Winter Semester 2017/18

Exercise Sheet 9 – Inference relations

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Dr. (habil.) Anni-Yasmin Turhan

Exercise 9.1 Prove Lemma 6.4, which states:
If C satisfies absorption, then distribution is equivalent to the following conditions:

(a) If $M = Th(M)$ and $N = Th(N)$ then $C(M) \cap C(N) \subseteq C(M \cap N)$

(b) $C(T \cup M) \cap C(T \cup N) \subseteq C\big(T \cup (Th(M) \cap Th(N))\big)$.

Exercise 9.2 Show that a supraclassical inference relation always satisfies Inclusion.

Exercise 9.3 Show that Absorption implies Right And, Right Weakening and Left Logical Equivalence.

Exercise 9.4 Let C be a supraclassical inference relation, and M and N sets of (propositional) formulas. Show that $M \mid\!\sim N$ iff $Th(M) \mid\!\sim Th(N)$.

Hint: Use Absorption.