



## Introduction to nonmonotonic reasoning

Winter Semester 2019/20

### Exercise Sheet 10 – Inference relations, properties

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**Exercise 10.1** The properties that can be established via Absorption (slide 191) are defined by means of the nonmonotonic inference relation  $\vdash$ . Give an equivalent alternative definition of these properties using the inference operation  $C()$ .

**Exercise 10.2** Show that a supraclassical inference relation always satisfies Inclusion.

**Exercise 10.3** The property *Reciprocity* holds for an inference operation  $C$  iff:

$$M \subseteq C(N) \text{ and } N \subseteq C(M) \text{ implies } C(M) = C(N).$$

Prove or refute the following claim: Let  $C$  be an inference operation that satisfies Inclusion. Then  $C$  satisfies Cumulativity iff  $C$  satisfies Reciprocity.

**Exercise 10.4** Show that Absorption implies Right And, Right Weakening and Left Logical Equivalence.