

Logic and Learning

TOSS 2026

Homework 1

hand-in deadline: Wednesday, July 1st at 23:59

Ex. 1 [Logical inference] Consider the following knowledge base $KB = \{\neg p \rightarrow q, q \rightarrow p, p \rightarrow r \wedge s\}$. Decide if the formula $p \wedge r \wedge s$ follows from KB using propositional truth tables.

Ex. 2 [AGM remainder sets] Let $A = \{p, q, p \wedge q, p \vee q, p \rightarrow q\}$ be a belief base. Which of the following sets are possible result of contraction with q ?

set of formulas	yes	no
$\{p, p \vee q\}$		
$\{p \rightarrow q\}$		
$\{p \vee q, p \rightarrow q\}$		
$\{p \vee q\}$		

Ex. 3 [BR on belief bases] Give an example (different than in Lecture 1) of two belief bases that are statically equivalent (i.e., they generate the same belief sets), but are not dynamically equivalent.

Ex. 4 [BR on plausibility orders] Assume Bob's belief set $B = Cn(\{p, p \leftrightarrow q, \neg r\})$. Come up with an appropriate prior plausibility order on W (the set of all possible truth assignments over p, q, r), which will satisfy both of the requirements below:

1. after revision with r Bob would believe that $\neg q$;
2. after contraction with $p \rightarrow q$ Bob would believe that p .