# CSED433 Computational Logic – HW 2

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## 1 Problem 1

**Lemma 1.** $((A \lor B) \supset C) \supset ((A \supset C) \land (B \supset C))$ *true*

$$
\cfrac{\cfrac{\cfrac{\overline{A \lor B \supset C \ true}}{} x \quad \cfrac{\cfrac{\overline{A \ true}}{A \lor B \ true} a \ \lor I_L}{} }{\cfrac{C \ true}{A \supset C \ true} \supset I^a} \supset E \qquad \cfrac{\cfrac{\overline{A \lor B \supset C \ true}}{} x \quad \cfrac{\cfrac{\overline{B \ true}}{A \lor B \ true} b \ \lor I_L}{}}{\cfrac{C \ true}{B \supset C \ true} \supset I^b} \supset E}{\cfrac{(A \supset B) \land (A \supset C) \ true}{((A \lor B) \supset C) \supset ((A \supset C) \land (B \supset C)) \ true} \supset I^x} \land I
$$

## 2 Problem 2

**Lemma 2.** $((A \supset C) \land (B \supset C)) \supset ((A \lor B) \supset C)$ *true*

$$
\cfrac{\cfrac{\cfrac{\cfrac{\overline{(A \supset C) \land (B \supset C) \ true}}{A \supset C \ true} x \ \land E_L \quad \overline{A \ true} a}{C \ true} \supset E \qquad \cfrac{\cfrac{\overline{(A \supset C) \land (B \supset C) \ true}}{B \supset C \ true} x \ \land E_R \quad \overline{B \ true} b}{C \ true} \supset E \qquad \overline{A \land B \ true}}{C \ true} \lor E^{a,b}}{\cfrac{\cfrac{C \ true}{(A \lor B) \supset C \ true} \supset I^{a,b}}{((A \supset C) \land (B \supset C)) \supset ((A \lor B) \supset C) \ true} \supset I^x}
$$

## 3 Problem 3

**Lemma 3.** $\neg\neg\neg A \supset \neg A$ *true*

$$\overline{TODO}$$

## 4 Problem 4

**Lemma 4.** $(\neg\neg(A \lor \neg A) \supset (A \lor \neg A)) \supset (A \lor \neg A)$ *true*

$$\overline{TODO}$$