

Exercise 3 (deadline: October 22nd, 4pm)

Exercise 4.16 (b)

Draw the parse tree for the formula $r \wedge \neg p \wedge q \rightarrow ((p \leftrightarrow \neg q) \rightarrow r)$ and mark the nodes corresponding to the negative occurrences of subformulas (e.g., encircle them). Write down all negative subformulas of this formula.

Part of Exercise 5.4

Apply the definitional clausal form transformation algorithm (the non-optimized version) to the formula

$$\neg((p \rightarrow q) \leftrightarrow (\neg q \rightarrow \neg p))$$

Exercise 5.7

Apply the DPLL algorithm to the following sets of clauses:

$$\begin{array}{cccc} p \vee q \vee r, & \neg p \vee \neg q \vee \neg r, & p \vee \neg q \vee \neg r, & \neg p \vee q, \\ \neg p \vee r, & p \vee q \vee \neg r, & p \vee \neg q \vee r. & \end{array}$$

Is this set satisfiable? If yes, find a model of this set.

Exercise 5.8

Apply the DPLL algorithm to the following sets of clauses:

$$\begin{array}{ccc} p_1 \vee p_3, & \neg p_2 \vee \neg p_3, & p_1 \vee \neg p_3, \\ \neg p_1 \vee p_2, & p_1 \vee p_2 \vee \neg p_3, & p_1 \vee p_2 \vee p_3. \end{array}$$

Is this set satisfiable? If yes, find a model of this set.