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Tutorials for “Automated Reasoning II”  
Exercise sheet 12

**Exercise 12.1:** ( *P* )

Consider the following first-order clause set with equality

- 1  $\neg P(f(g(x), x)) \vee P(f(x, y))$
- 2  $\neg P(x) \vee P(g(x))$
- 3  $\neg P(x) \vee \neg R(y) \vee P(f(x, y))$
- 4  $\neg P(f(g(x), h(x))) \vee h(x) \approx x$
- 5  $\neg P(f(h(x), x)) \vee R(g(x))$

and find an ordering, selection strategy, such that the clause set can be finitely saturated.

**Exercise 12.2:** ( *P* )

Prove or disprove that the following rule is a reduction rule, i.e., is compatible with the abstract redundancy notion.

$$\mathbf{ElimEq} \quad (N \uplus \{C \vee x \approx t\}) \Rightarrow_{\text{SUPE}} (N \cup \{C\{x \mapsto t\}\})$$

where  $x \notin \text{vars}(t)$