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Tutorials for "Automated Reasoning WS18/19"
Exercise sheet 14

Exercise 14.1 (7.8):
Consider the theory of linear rational arithmetic and the clauses $2x_1 + x_2 + 2x_3 \geq 6$, $2x_1 + x_2 - x_3 \leq 3$, $x_1 + 2x_2 + x_3 \approx 6$, $x_3 - x_1 > 0 \vee x_2 - x_3 < 1$ and check via CDCL(LA) whether this clause set is satisfiable.

Exercise 14.2 (7.9):
Use the CDCL(EUF) calculus to determine whether the following set of clauses is satisfiable or not:

$$f(a,b) \not\approx f(a',b') \quad (1)$$
$$g(g(c)) \not\approx c \quad (2)$$
$$g(d) \approx c \vee g(g(c)) \approx c \quad (3)$$
$$a \approx a' \vee c \approx d \quad (4)$$
$$b \approx b' \vee c \approx d \quad (5)$$

Exercise* 14.3 (7.10):
In many applications of CDCL or CDCL(T), one does not only want a yes/no answer, but also an explanation for it. In the case of an unsatisfiable input, this explanation is an unsatisfiable core, i.e., a (small) subset of the input clauses that is already sufficient to show $\mathcal{T}$-inconsistency. How can we get an unsatisfiable core from a CDCL(T) proof?

It is not encouraged to prepare joint solutions, because we do not support joint exams.