# Exercises for Modern SAT Solver Part A

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7 February, 2012

1. What is the worst-case complexity of translating a propositional formula into NNF? Does this change if you allow sharing (circuits), both in the original formula/circuit and in the resulting NNF?

2. After obtaining a formula in NNF. What is the complexity of turning it into a CNF only using the distributivity law to produce a logically equivalent formula? Measure the complexity in terms of the "height" of the NNF, or, more specifically, the number of alternating conjunctions and disjunctions.

3. What is the complexity of the Tseitin translation? Why does it not generate a logically equivalent formula?

4. Show that the following formula is a tautology

$$((c \to t) \wedge (\bar{c} \to e) \wedge (t \vee e)) \;\to\; (c \wedge t \;\vee\; \bar{c} \wedge e)$$

   by first negating it, then translating it into CNF, and finally applying either variable elimination or DPLL.