

Decision Procedures and Verification

Seminar 10

1. (1 point) (Nelson–Oppen procedure) Prove that the following formula is unsatisfiable using the Nelson–Oppen procedure, where the variables are interpreted over the integers:

$$g(f(x_1 - 2)) = x_1 + 2 \wedge g(f(x_2)) = x_2 - 2 \wedge (x_2 + 1 = x_1 - 1)$$

2. (1 point) (Delayed Theory Combination) Simulate the run of Delayed Theory Combination algorithm on the following formula:

$$\neg(f(x) = f(1)) \wedge (A \leftrightarrow \neg(f(x) = f(2))) \wedge 1 \leq x \wedge x \leq 2$$

3. (1 point) (Mutating a model in Simplex) Suggest a method how to look for a different assignment of the variables satisfying current set of constraints, given current satisfying assignment in General Simplex algorithm.