Bonus Exercise 11: SMT – Integer Arithmetics

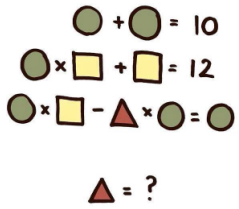
General Remarks

For solving this exercise you can earn up to one point that is added to the result of the minitest on Jan 15 if you did not get the full points. Note that the maximum of points that can be obtained for both together is five.

Submit your solution until **Monday, Jan 15, 18:00** via Moodle.

Description of the Task

Given is the following puzzle[1]:



1. Encode this puzzle in SMTLib2 format using Integer Arithmetic (IA) and solve it with an SMT Solver, e.g., Z3[2][3]
2. Replace numbers 10 and 12 by the last two digits of your matriculation number. Does the puzzle still have a solution? If yes, replace 10 and 12 by the last two digits of your matriculation number plus one (e.g., if it ends with 02, use 03). Now change the puzzle in such a way that it has a solution and such that it has still three constraints. Try to make as few modifications as possible.

[1] from `https://sat-smt.codes/SAT_SMT_by_example.pdf`
[2] `https://github.com/Z3Prover/z3`
[3] a webinterface of Z3: `https://microsoft.github.io/z3guide/playground/Freeform`

Submission

Upload two text files puzzle1.smt2 and puzzle2.smt2.

- File puzzle1.smt2 contains the encoding of the original puzzle in SMTLib2 format using IA. Include the solution of the puzzle as comment.
- File puzzle2.smt2 contains the modified puzzle. Document in comments the solution and also shortly describe your modifications.