PEQNP Python Library Benchmarks

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***Abstract*—The formulas that are generated by PEQNP Library represent some particular instances of the following NP-Problems: 01 Integer Programming, Fermat Factorization, Schur Triplets, Sum Subset.**

***Index Terms*—CNF, CSP, Encoding, Benchmarks**

I. The PEQNP Library

The PEQNP System its an automatic CNF encoder and SAT Solver for General Constrained Diophantine Equations and NP-Complete Problems, fully integrated with Python [1].

II. SAT Competition 2020 Benchmarks

The collected formulas have generated with PEQNP Library for the following problems:

A. 01 Integer Programming

Given an integer matrix C and integer vector d, exist a 0-1 vector x such that $Cx = d$?

B. Fermat Factorization

Given an integer pq, exist two integers p and q such that $(p-q)(p+q) = pq$ with $1 < p - q < p + q$?

C. Schur Triplets

Given a list of $3n$ distinct positive integers is there a partition of the list into n triples (a_i, b_i, c_i) such that $a_i + b_i = c_i$ for each triple i?

D. Sum Subset

. Given a list of positive integers U with a target t exist a $S \subset U$ such that $\Sigma(S) = t$?

III. Availability

The source of PEQNP Library can be found at www.peqnp.science internally integrated with SLIME SAT Solver [2].

References

[1] www.python.org Python is an interpreted, high-level, general-purpose programming language.
[2] www.peqnp.science SLIME 4: A Free World Class High Performance SAT Solver.

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