MU-TERM

2018 Termination Competition

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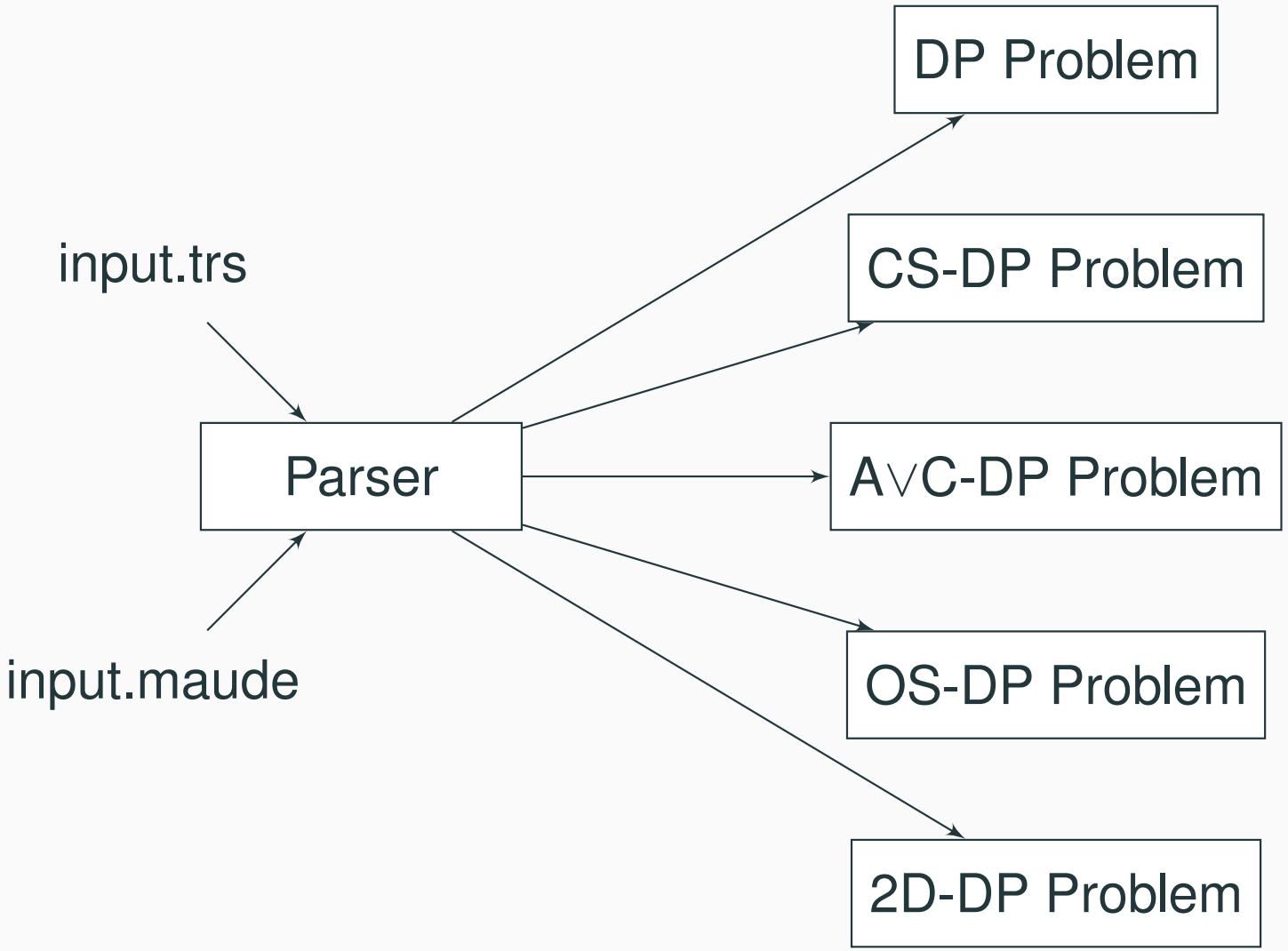
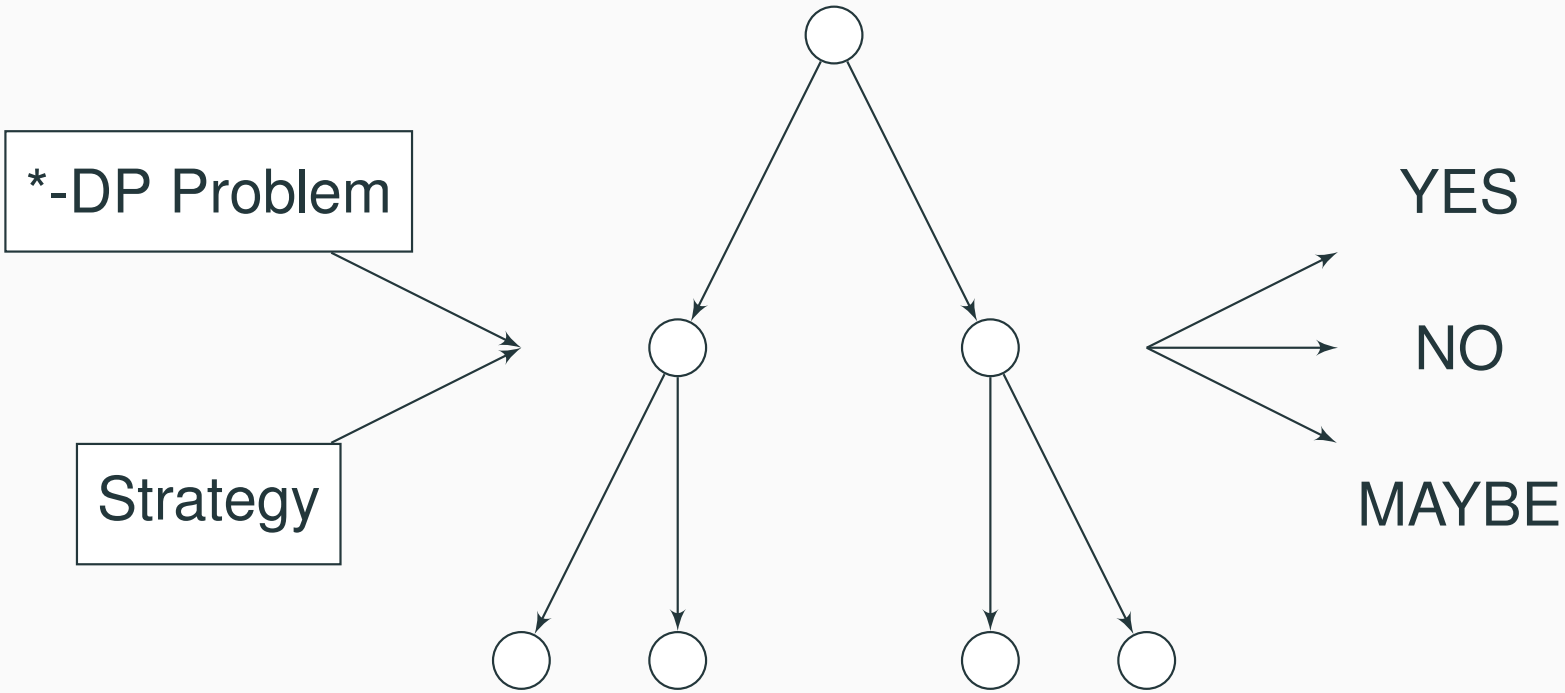
Overview

MU-TERM 5.18 is a tool which can be used to verify a number of termination properties of variants of Term Rewriting Systems (TRSs) using different variants of the Dependency Pair (DP) Framework.

Tool Diagram (1/2)



Tool Diagram (2/2)



Backends

- NLSOL: NonLinear aritmetic SOLver
  - Used to generate (matrix) polynomial interpretations over $\mathbb{Q}$.
- Barcelogics: SMT Solver
  - Used to generate (matrix) polynomial interpretations over $\mathbb{N}$ and $\mathbb{Z}$.
- AGES: Semantic-based automatic genarator of logical models.
  - Used to generate piecewise (matrix) polynomial interpretations over convex polytopic domains over $\mathbb{Z}$.

Recent Publications

- S. Lucas, J. Meseguer, and R. Gutiérrez. The 2D Dependency Pair Framework for conditional rewrite systems. Part I: definition and basic processors. Journal of Computer and System Sciences, 96:74-106, 2018.
- S. Lucas and R. Gutiérrez. Use of logical models for proving infeasibility in term rewriting. Information Processing Letters 136, 90-95, 2018.
- S. Lucas and R. Gutiérrez. Automatic Synthesis of Logical Models for Order-Sorted First-Order Theories. Journal of Automated Reasoning, 60:465-501, 2018.

Results in Termination Competition 2018

Category	Position	Solved
TRS Standard	4th	832/1498
SRS Standard	5th	136/1541
TRS Equational	2nd	63/76
TRS Conditional	1st	101/117
TRS Context-Sensitive	1st	101/108
TRS Innermost	2nd	208/366

Conclusions and Future Work

- Most successful tool for proving termination of conditional TRSs and context-sensitive TRSs.
- In the TRS Conditional category we integrated the generation of convex polytopic domains using AGES.
- In our next version we want to fully integrate AGES in the rest of categories.