

Various Modeling Tools

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Abstract

Virtually hundreds of tools and applications exist to help users to build and to solve mathematical models. Lists can be found on the Internet. This paper rather tries to categorize them to give a “meta-overview” (which certainly is incomplete). The situation is rapidly changing and new approaches emerge all the time.

I try to group them into six categories: programming languages, modeling languages, all-in-one applications, applications for special domains, pure solvers, and development tools. They are explained in the following and examples – for some executable examples – are given.

...Paper finished soon ...

This document gives a short overview of different modeling tools and approaches available on the Internet.

1 Introduction

2 Programming Languages

Python, GurobiPy: Will17b

[Gurobi Python](#) [gurobipy](#) [Pulp Python](#) [Python-MIP](#) [Google OR-tools](#) [Fico Examples](#)

Julia, C,

3 Algebraic Modeling Languages

Modeling language Zimpl together with SCIP is bundled in the SCIP Optimization Suite (see Google "Zimpl" then download. Academic licence is free. Distribution contains about 5000 files, source code included

4 All-in-one Applications

Mathematica <https://www.g2.com/products/mathematica/competitors/alternatives>

MATLAB. (623) 4.5 out of 5. GNU Octave. (54) 4.2 out of 5. Maple.

(14) 4.3 out of 5. SageMath. (7) 4.1 out of 5. Scilab. (58) 4.5 out

of 5. Fusion 360. (369) 4.5 out of 5. Inventor. (399) 4.3 out of 5.
SOLIDWORKS. (422) 4.4 out of 5.

5 Applications for Specific Domains

6 Pure Solvers

7 Development Tools

JuMP. Data and plotting: <https://jump.dev/JuMP.jl/stable/tutorials/getting-started>

References

- [1] MatMod. Homepage for Learning Mathematical Modeling :
<https://matmod.ch> .