Useful Tips and Tricks for Getting Started with Gurobi

Dan Jeffrey
Welcome to the Webinar

Useful Tips and Tricks for Getting Started with Gurobi
Speaker Introduction

Dan Jeffrey

• Has twenty years of professional experience in Math Programming and Data Science, working as a technical product expert and as a consultant

• He has architecture and programming expertise with all major computer programming languages, math programming experience with Python, AMPL, and OPL plus programming expertise with the AMPL Solver library.

• Dan is a MIP Fanatic — working as a member of the Gurobi Support Team.
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Agenda

Running Gurobi

Key Documentation
  • Modeling basics
  • Reference documents and how to use them
  • Modeling Videos
  • Zendesk Guide

Sample Models
  • API examples
  • Building block examples
  • Online examples
  • Optimization Application Demos

Performance
  • Generating model files
  • Tuning
  • Solver logs
  • Videos
Running Gurobi

Quick Start:
• Quick Start for install https://www.gurobi.com/resource/starting-with-gurobi/

Download Gurobi
• https://www.gurobi.com/downloads/gurobi-optimizer-eula/

Install
• Set three environment variables
  • export GRB_VER=811
  • export GUROBI_HOME=/opt/gurobi$\{GRB_VER\}/linux64
  • export PATH=${GUROBI_HOME}/bin:${GUROBI_SERVER_HOME}/bin:"${PATH}"
  • export LD_LIBRARY_PATH=${GUROBI_HOME}/lib
  • Windows installer does this for you
• License
  • Install on the correct computer
  • Caution with Compute Server and other license types that are client/server
• Commonly-used Gurobi programs:
  • gurobi.sh or gurobi.bat - interactive shell (Python)
  • gurobi_cl - command line solver
  • grbtune - tuner (more later)
• API-specific installation instructions
  • in Quick Start
First Steps

Modeling – for those new to math programming

https://www.gurobi.com/resource/modeling-basics/

- Books: https://www.gurobi.com/resource/books-blogs/
- Introductory Modeling Videos
  - https://www.gurobi.com/resource/abremod-getting-started-end/

Reference documents and how to use them

https://www.gurobi.com/documentation/current/refman/index.html

- API filter
  - Check your language
  - Filters menu choices, not search though
- Most important Page: API Details
  https://www.gurobi.com/documentation/current/refman/py_python_api_details.html
- parameters - esp Parameter Guidelines
  https://www.gurobi.com/documentation/current/refman/parameters.html
- attributes
  https://www.gurobi.com/documentation/current/refman/attributes.html
Next Steps

Support Portal

• Knowledge Base
  • [https://support.gurobi.com/hc/en-us/categories/360000840331-Knowledge-Base](https://support.gurobi.com/hc/en-us/categories/360000840331-Knowledge-Base)
• Community
  • [https://support.gurobi.com/hc/en-us/community/topics](https://support.gurobi.com/hc/en-us/community/topics)
  • Replaces Google Group
• Submit a ticket

Python

• Installing Gurobi into Python
  • setup.py
  • Anaconda
• Python modeling tutorials:
  • [https://www.gurobi.com/resource/python-i-webinar/](https://www.gurobi.com/resource/python-i-webinar/)
  • [https://www.gurobi.com/resource/python-ii-webinar/](https://www.gurobi.com/resource/python-ii-webinar/)
  • [https://www.gurobi.com/resource/python-iii-webinar/](https://www.gurobi.com/resource/python-iii-webinar/)
Sample Models

Product Examples
- $GUROBI_HOME/examples/<your favorite language>
- API examples
- Building block examples
- Don’t miss /build
- Example Tour
  https://www.gurobi.com/documentation/current/examples/examples.html

Online examples
- Product samples indexed
  https://www.gurobi.com/resource/functional-code-examples/
- Modeling examples
  https://www.gurobi.com/resource/modeling-examples/
- Modeling library
  https://github.com/Gurobi/modeling-examples

Optimization Application Demos
http://demos.gurobi.com
Video: https://www.gurobi.com/resource/gurobi-optimization-application-demos/
Performance

Videos

- [https://www.gurobi.com/resource/intro-to-tuning-webinar/](https://www.gurobi.com/resource/intro-to-tuning-webinar/)
- [https://www.gurobi.com/resource/parameter-setting/](https://www.gurobi.com/resource/parameter-setting/)

Solver logs


Tuning

- grbtune
- Gurobi support for maintenance customers
- Video: [https://www.gurobi.com/resource/automatic-tuning-tool/](https://www.gurobi.com/resource/automatic-tuning-tool/)

Generating model files

- model.write("filename.mps")
  or
Thank You – Questions?