Setup Guide: Julia and Gurobi Optimizer (macOS & Windows)

This document provides step-by-step instructions to install **Julia** and configure the **Gurobi Optimizer** with Julia using `JuMP`.

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1. Install Julia

macOS

1. Visit the Julia Downloads Page.
2. Download the **macOS .dmg** installer for the latest stable release (e.g., Julia 1.x).
3. Open the `.dmg` file and drag the **Julia app** into the **Applications** folder.
4. (Optional) Add Julia to your terminal PATH for easier access:
5. `echo 'export PATH="/Applications/Julia-1.x.app/Contents/Resources/julia/bin:$PATH"' >> ~/.zshrc`
6. `source ~/.zshrc`

   Replace `1.x` with your installed version.

Windows

1. Visit the Julia Downloads Page.
2. Download the **Windows 64-bit installer** (`.exe`).
3. Run the installer and follow the instructions (check "Add Julia to PATH" during installation).
4. Open **Command Prompt** or **PowerShell** and verify installation:
5. `julia --version`

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2. Install Gurobi

macOS

1. Create a Gurobi account and download the latest macOS installer.
2. Open the downloaded `.pkg` file and follow the installation wizard.
3. By default, Gurobi installs into `/Library/gurobi<version>/`.
4. Add Gurobi to your shell PATH (replace `<version>`):
5. `echo 'export GUROBI_HOME="/Library/gurobi<version>/mac64"' >> ~/.zshrc`
6. `echo 'export PATH="$GUROBI_HOME/bin:$PATH"' >> ~/.zshrc`
7. `echo 'export DYLD_LIBRARY_PATH="$GUROBI_HOME/lib:$DYLD_LIBRARY_PATH"' >> ~/.zshrc`

8. `source ~/.zshrc`

Windows

1. Download the Windows installer from the Gurobi download page.
2. Run the installer and follow the wizard.
3. By default, Gurobi is installed in `C:\gurobi<version>\`.
4. Add environment variables:
    - Open **Control Panel → System → Advanced System Settings → Environment Variables**.
    - Add a new variable:
        - `GUROBI_HOME = C:\gurobi<version>\win64`
    - Edit the `Path` variable and add:
        - `%GUROBI_HOME%\bin`
    - Add another variable:
        - `GRB_LICENSE_FILE = C:\gurobi<version>\gurobi.lic`

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3. Obtain & Activate License

1. Log in to your Gurobi account.
2. If you are a student or academic, request a **free academic license**.
3. Once approved, you will get a license key.
4. Open a terminal (macOS) or Command Prompt (Windows) and run:
5. `grbgetkey <license_key>`

   Example:

   ```
   grbgetkey 123456-abcd-123456
   ```

6. The license file (`gurobi.lic`) will be placed in your home directory (or where you specify).

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4. Configure Julia with Gurobi

1. Open Julia REPL (type `julia` in terminal/command prompt).
2. Enter package mode by pressing `]`.
3. Add the required packages:
4. `pkg> add JuMP`
5. `pkg> add Gurobi`
6. Test installation in Julia:
7. `using JuMP, Gurobi`
8.
9. `model = Model(Gurobi.Optimizer)`

```
@variable(model, x >= 0)
@variable(model, y >= 0)
@objective(model, Max, 5x + 3y)
@constraint(model, x + y <= 10)
optimize!(model)

println("Optimal solution: ", value.(x), value.(y))
println("Objective value: ", objective_value(model))
```

If the solver runs without errors, the setup is successful.

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5. Troubleshooting

- **Gurobi not found in Julia**
  Ensure `GUROBI_HOME`, `PATH`, and license file are set correctly.
- **macOS security issues**
  If blocked, go to **System Preferences → Security & Privacy → Allow** for Gurobi.
- **Windows PATH issues**
  Reopen your terminal after modifying environment variables.

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6. References

- Julia Downloads
- JuMP Documentation
- Gurobi Installation Guide

You are now ready to solve optimization problems in Julia using Gurobi!