Overview – Julia, JuMP, and Solvers

In this class, you will be using Julia, JuMP, and different solvers to solve optimization problems. Here is a breakdown of each of these components.

Julia

Julia is a high-performance dynamic **programming language** for technical computing developed by MIT students. It has several **packages** that can be added.

JuMP

JuMP is a **package** for Julia that we will be using for optimization problems. It is a language for mathematical programming problems.

JuMP allows you to:

- Create a model
- Define decision variables and constraints
- Set an objective, etc.

Solvers

JuMP supports a number of open-source and commercial **solvers** including COIN Clp, COIN Cbc, Gurobi, etc.

The **solver** is what solves the optimization models.

Solvers can solve

- Linear optimization problems
- Mixed integer problems
- Nonlinear optimization problems, etc.

In this class, we will either use JuMP's built in solvers (COIN Clp/Cbc), or Gurobi which you can download from online. Please see the ***"Gurobi Installation Guide"*** to download Gurobi.