

Model-based Optimization

When solving optimization problems we see two general approaches: Method and Model based. While the former comes natural to people with an algorithmic background, the latter requires a completely different way of thinking to solve such problem. Rather than describing an algorithm, one describes the problem in a very generic form as a mathematical optimization model using decision variables and constraints without thinking about a specific solution method. Such mathematical optimization models are can be solved by standardized methods (known as solvers) that know nothing about the specific problem (structure). This approach turns out to be extremely flexible and with today's solver technology is superior to other ways of tackling most optimization problem. The General Algebraic Modeling System (GAMS) has pioneered the software that supports the model-based approach to mathematical optimization problems. We give a broad overview of the components of this approach by example and demonstrate the path from idea, via model and implementation, to deployment.