

Convex.jl Tutorial

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The Julia programming language

- ▶ a new programming language for scientific computing
 - developed by a group mostly from MIT
 - fully open source, *i.e.*, free
 - convenient syntax for building math constructs like vectors, matrices, etc.
 - super fast

Installing Julia

- ▶ download Julia v0.3 from <http://julialang.org/downloads/>
- ▶ follow the on-screen instructions to install

Resources for learning Julia

- ▶ Julia official documentation:
<http://docs.julialang.org/en/release-0.3/>
- ▶ Basic Julia tutorials:
<http://learnxinyminutes.com/docs/julia/>
- ▶ Setting up the IJulia environment:
<https://github.com/stevengj/julia-mit>

Disciplined Convex Programming

- ▶ DCP is a system for constructing mathematical expressions with definitive curvature
- ▶ covers a wide variety of convex optimization problems (but not all of them!)
- ▶ allows software to easily detect if an optimization problem is convex
- ▶ more on DCP here: <http://dcp.stanford.edu>

Convex.jl

- ▶ Julia package for Disciplined Convex Programming
 - serves as an interface between convex optimization problems on paper and backend solvers
 - allows many convex optimization problems to be described in natural, mathematical syntax

Installing Convex.jl

1. open a Julia terminal
2. update to the most recent listing of packages
`Pkg.update()`
3. install SCS, the default backend solver for Convex.jl
`Pkg.add("SCS")`
4. install Convex.jl
`Pkg.add("Convex")`

Basic Convex.jl program

- ▶ try it out just to make sure everything installed correctly using Convex

```
x = Variable()  
p = minimize(x, x >= 0)  
solve!(p)
```


Convex.jl full documentation

- ▶ full documentation of how to construct and solve convex optimization problems in Convex.jl can be found at <http://convexjl.readthedocs.org>