# Lecture III - Packages and Data Management

# Applied Optimization with Julia

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# Quick Recap from last Week

# Variables and Data Types

- Variables are used to store values
- Assign a value to a variable using the = operator
- You can use different data types for variables
- You can change the value of a variable

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You can use the typeof function to check the type of a variable.

#### **Vectors and Matrices**

- Vectors and matrices are used to store multiple values
- You can create a them using the [ and ] operators
- · Access their elements using square brackets

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🕜 Tip

You can use the push! function to add elements to a vector or the pop! function to remove elements from a vector.

# Comparisons and Logic

- Comparisons are used to compare values
- == checks if two values are equal
- != checks if two values are not equal
- < checks if one value is smaller than the other
- >= checks if one value is greater than or equal to the other
- && checks if two values are true
- | checks if at least one of two values is true

#### Loops

- Loops are used to repeat code
- for loop repeats code for a fixed number of times
- while loop repeats code until a condition is met
- if statement checks if a condition is true
- else executes code if a condition is false
- elseif checks if a condition is true and executes if it is

### Scope

- Scope determines where a variable is defined and lives
- global keyword defines a global variable
- local keyword defines a local variable
- let keyword defines a local variable

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Global variables usually make your code much slower, if they are not defined as constants. But for this leeture this is not that important.

#### Solutions from last Week

- The tutorials from last week will be available on Friday
- You can access them in the project folder on Github
- Click on the little cat icon on the bottom right

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You can ask questions anytime in class or via email!

# Five Tutorials for this Week

# Topics of the Tutorials

- Functions: Learn how to define and use functions
- Packages: Learn how to install and use packages
- DataFrames: Learn how to work with tabular data in Julia
- IO: Learn how to read and write data in Julia
- Plots: Learn how to create plots in Julia

#### Get started with the tutorials

- Download this weeks tutorials and start with the first one
- Remember, you can ask questions anytime!

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# i And that's it for this lecture!

The remaining time we will already start working on the problems of the third lecture.

# Literature

# Literature

- Lauwens, B., & Downey, A. B. (2019). Think Julia: How to think like a computer scientist (First edition). O'Reilly®. Link to the free book website.
- Julia Documentation

For more interesting literature to learn more about Julia, take a look at the literature list of this course.

# Bibliography