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

> **Tip**
>
> 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

> **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

> **Tip**
>
> 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

> **Tip**
>
> 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!**

> **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.