R Coding
- Course Syllabus -

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Lecture 0: Introduction to R

Mathematics:
- Vectors & Matrices
- Matrix Algebra
- Functions

Programming:
- What is a Programming Language?
- Programming & Natural Language: Similarities and Differences

R:
- What is the R Language?
- CRAN & Packages
- Objects and Functions
- R Environment
- R messages
- The R GUI
- The RStudio IDE
- Working with the RStudio IDE
- How to write R code: style guidelines

Basic R:
- Assignment Operator and Variables
- Some fundamental R commands
- Arithmetic with R
- Data Types
- Data Structures
- Accessing values & Subsetting

Intermediate R:
- Relational Operators
- Logical Operators
- Conditional subsetting
- Conditional Statements
- Looping Together
- Functions

Extra Topics:
- Tidy Data
- Importing Data with R
- Statistics

Lecture 0: RMarkdown

RMarkdown

Lecture 1: Tidyverse Basics

Tidyverse:
- Core Tidyverse
- Import
- Wrangle
- Program
- Model

R Code Evaluation Methods:
- Standard Evaluation
- Non-Standard Evaluation
- Tidy Evaluation

Pipe Operator:
- Basic Piping
- Argument Placeholder
- Re-using Placeholder for Attributes

Tibble:
- Tibble Structure

Stringr:
- Modify
- Count Patterns
- Detect Patterns
- Extract Patterns
- Removing & Replacing Patterns
- Trimming
- Testing Patterns
- Base R Functions

Forcats:
- Count Levels
- Order Levels
- Modify Levels

Lubridate:
- Parse
- Differences
- Extract Time Periods
- Round

Readr:
- Readr
- Readxl

Lecture 2: Tidyverse Wrangling

Tidyr:
- Column Headers
- Multiple Variables

- Variables in Rows and Columns
- Multiple Types
- One Type in Multiple Tables

Dplyr:
- Rows
- Columns
- Groups
- Joins
- Utilities

Dbplyr:
- Dplyr database backend

Lecture 3: Tidyverse Visualization

Ggplot2:
- Initialization
- Aesthetics Mappings
- Geometries
- Statistical Transformations
- Position Adjustments
- Coordinate Systems
- Facets
- Other Useful Graphical Designs

Plotly:
- Ggplotly conversion

Lecture 4: Tidyverse Functional Programming

Purrr:
- For Loop vs Functionals
- The Map Functions
- The Power of Mapping
- Mapping Over Multiple Arguments
- Invoking Different Functions

Lecture 5: Tidymodels

Tidymodels:
- Recipes
- Engines
- Modelling
- Predicting

Lecture 6: Flexdashboard UI

Static UI:
- Layouts
- Components
- Sizing

- Paging
- Storyboards
- Sidebars

Lecture 7: Flexdashboard UI - Shiny

Interactive UI:
- Basic Shiny Components
- Inputs
- Rendering Functions
- Shinywidgets, Shinyjs, Shinymanager

Lecture 8: Flexdashboard in Production

Production:
- GitHub Pages for static .html
- Shiny Server for reactive .Rmd
- Shinyapps.io