Intro To R - Overview

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This document outlines the proposed sections and questions to be covered in the new intro to R workshop.

Overview of RStudio

Questions:
1. What are the four panels in RStudio?
2. How is a project set up in RStudio?
3. Where do we save files for RStudio to use?
4. How and why do we install packages?

Objectives:
1. Navigate the RStudio environment.
2. Set up an RStudio project for the workshop.
3. Save the workshop files from the vle into the project working directory.
4. Install the `dplyr`, `readr` and `ggplot2` packages using the packages tab.

Writing code in a script

Questions:
1. What are the common terms used to describe R code?
2. How can data be entered into RStudio manually?
3. How are notes written alongside code?
4. What is the structure of commands in R?

Objectives:
1. Define the following R terminology: object, assign, call, function, arguments and options.
2. Assign values to a named vector using the `c()` function.
3. Write comments to make a script easier to interpret.
4. Use built-in functions and control their working with arguments and options.

Importing and viewing data

Questions:
1. How is data from a .csv file imported into R?
2. How is a summary view of a `tibble` viewed in R?
3. What is a factor variable in R?
4. How are string variables converted to factor variables?

Objectives:
1. Use `read_csv()` to import data from a .csv file as a `tibble`.
2. Use `head()`, `str()` and `summary()` to inspect a `tibble`.

3. Describe the difference between a string variable and a factor variable.
4. Use `factor()` to convert a string variable to a character variable.

Data wrangling

Questions:
1. How can rows from a `tibble` be selected?
2. How can columns from a `tibble` be selected?
3. How can multiple data wrangling steps be combined into one command?
4. How can new columns be created based on existing columns?
5. How can group-specific summary statistics be obtained?
6. How can a `tibble` be saved as a .csv file?

Objectives:
1. Use `filter()` to select rows from a `tibble`.
2. Use `select()` to select columns from a `tibble`.
3. Use the pipe operator, `%>%`, to link commands together.
4. Use `mutate()` to create new columns based on existing columns.
5. Use `group_by()`, `summarise()`, `count()` and `mean()` to obtain group-specific summary statistics.
6. Use `write_csv()` to save a `tibble` as a .csv file.

Plotting data with ggplot2

Questions:
1. What is the general format of a `ggplot()` command?
2. How can this format be adapted for scatterplots and boxplots?
3. How are additional elements added to the plot, such as a title?
4. How are multiple ggplot graphs grouped into one plotting region?
5. How are ggplot objects exported from R?

Objectives:
1. Describe the core components of a `ggplot()` command.
2. Create scatterplots and boxplots with using the `ggplot2` package.
3. Adjust `ggplot2` objects, for example by adding a title.
4. Use the `patchwork` package to group multiple `ggplot()` graphs together.
5. Use `ggsave()` to export a ggplot plot.