Module 3: R

Submodule 6: Programming

Expected length: 0.5 day

Guiding question: How can we create our own functions, iterators, and data in R?

Concepts: functions, arguments, outputs, if loops, while loops, if/else, random numbers

Description: This lesson introduces students to the concepts of functions, iterators, and simulation.

Instructor Preparation: Run all code to ensure it generates the same output as described in the lesson.

| Materials and resources | Learning objectives |
| --- | --- |
| 06-programming\_deck.html | 1. Understanding of how functions work and how to write them  2. Understanding of how loops work and how to write them  3. Understanding if/else logic and what it looks like in practice  4. Familiarity with the concept of data simulation |

| Length | Lesson content | Guidelines, tips, and tricks |
| --- | --- | --- |
| 15min | Functions  Wickham and Grolemund, 2017, Chapter 19 | The concepts are introduced quickly so students can see them in use in the demos later. |
| 30min | Loops  Wickham and Grolemund, 2017, Chapter 21 | Participants should be following along in their own RStudio environments. |
| 30min | If/else logic  Alexander (eds), 2021, Chapter 47 |  |
| 30min | purr | Participants should be following along in their own RStudio environments. |
| 30min | Simulation  Alexander (eds), 2021, Chapter 63) | Participants should be following along in their own RStudio environments. |
| 60min | Formative exercise  1. Write a greeting function that says “good morning”, “good afternoon”, or “good evening”, depending on the time of day.  2. Simulate a dataset using a normal distribution with mean 100 and standard deviation 15 as variable X, and a quadratic transformation of X as variable Y. Graph your data. | Allow 30 minutes of independent work time.  Take up for 30 minutes, with RStudio open to demonstrate.  Ask students for errors they encountered. |