Data science for cognitive neuroscience and psychology (short summer course version) – brief course overview

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Welcome!

Thank you for registering for the *Data science for cognitive neuroscience and psychology* short course. This document provides a brief overview of the course. All other materials will be provided upon course commencement. Should you have any questions, please don't hesitate to contact me.

I look forward to exploring some data science fundamentals with you!

– Ina Bornkessel-Schlesewsky

Important details

Days and times:

- Wednesday, Jan 20th – Wednesday, Jan 27th; 9:30 am – 12:00 pm & 1:00 pm – 4:00 pm on each day[1]
- Note that the course will not take place on Tuesday, Jan 26th due to the Australia Day public holiday

Room: MAG B1-52

What you will need:

Please bring a laptop with which you can access the internet to each session (and a charger if needed).

Preparation:

You do not need to do anything to prepare for this course, as it is designed to be self-contained. Parts of the course will be loosely based on the book *R for Data Science* by Hadley Wickham and Garrett Grolemund. If you want to check it out before the course, it is freely available here.

[1] Note that each morning and afternoon session will include short breaks.

Join the course workspace on Slack:

We will be using Slack for communications about the course, e.g. for announcements, questions etc. You can join the course workspace via the following link:

https://join.slack.com/t/unisa-wg54095/shared_invite/zt-kqmur62d-hspieJMUbw7QD1B6VkmH_A

Brief course overview

The following units are designed to roughly correspond to one day each, but this might not be a one-to-one mapping. We will see how we go!

Unit 1: Introduction and basics

- Introduction: What is data science and why do we need it? More specifically, why do psychologists and cognitive neuroscientists need it?
- What to expect in this course
- Basic concepts of data exploration and visualisation
- Basic introduction to R and RStudio Cloud (the platform which we will be using for most of this course)
- Reproducible research and reproducible reports

Unit 2: Data wrangling and more on R

- Getting to know R — let's dig a big deeper
- Data wrangling: getting data into the right shape for exploration / visualisation
- More on exploration and visualisation using other examples
- Tips on what to look for and what to avoid

Unit 3: Open science

- Introduction to open science
- More on reproducibility and how RMarkdown can help
- Sharing and collaboration: introducing repositories and version control (e.g. git and GitHub; OSF)
- Others tools to foster open science (e.g. preprints and registered reports)

Unit 4: Your own project!

- Putting it all together with a mini project of your own choosing
- Work through from scratch to produce a reproducible report

Unit 5: Next steps

- Getting yourself set up for your own projects – installing R, RStudio, git etc. on your own computer

- Workflow tips
- Working as a team
- Where to go from here