Computer programming E140

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What will be covered in this course?

- Software: R and RStudio
- Mostly basic things in these programs
- Course will not cover many things
- Course will not be deep

Goals

At the end of this course...

- ...you understand basic concepts of R
- ...you can do a basic analysis in R
- ...you know where you can learn more about R

Prerequisites

- Basic demographic knowledge (e.g., you know what a ‘rate’ is)
- Basic statistical knowledge (e.g., you know what a ‘mean’ is)
- First experince using statistical software (Stata, Excel, SAS, SPSS, R, . . .)

Already an expert?

- Write a function that takes any integer as input and returns TRUE if the integer is a prime number, otherwise it returns FALSE
- Write a function that takes any integer as input and returns its amicable number if it exists, otherwise it returns FALSE
- Check one of the many tasks on rosettacode.org solved with R
- Replicate one of the many replicable articles available at Demographic Research
- Work on your own analysis

Contact

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Topics I work on/I am interested in

- Labor markets and aging
- Pensions and inequality
- Fertility, in particular fertility of men
- Longitudinal data analysis, in particular multistate modeling
- Identification and causal inference
- Survey methodology (variance estimation, missing data)

Course schedule

1. session: Date and time not set yet
2. session: Date and time not set yet
3. session: Date and time not set yet
4. session: Date and time not set yet
5. session: Date and time not set yet

Materials

Materials will be available from GitHub, also mirrored on OSF:

- https://github.com/christiandudel/EDSD2020
- https://osf.io/c6jru/

Materials will mostly consist of R code and some slides.

Assignment: Overview

- One assignment
- Assignment handed out on XX.YY.
- Deadline: ZZ.ZZ.
- Assignment will consist of several tasks: “Do this and that with R”, “Solve this problem with R”, etc.

Assignment: Your solutions

- You submit R code as solutions
- R code should be commented, explaining what is happening
- Code should work "out-of-the-box" without errors

Assignment: Deadline

- Deadline assignment: XX.ZZ.YY, 12am
- Send your solutions to me (dudel@demogr.mpg.de)
- You will get a confirmation (might take a few days, sorry)
- I might get back to you if I have problems with your file(s)
- It is your responsibility that your files are working!

Assignment: Groups

- You can work in groups
- Actually, I strongly suggest you work in groups!
- Please not more than five people per group
- Please submit your solutions only once per group
- Make clear who is member of the group when submitting

Assignment: Grading

- You can either “pass” or “fail”
- Your code should. . . –. . . work “out-of-the-box” –. . . be well-documented: Comments! –. . . should be (somewhat) efficient. If one step can do the work then don’t use two or more!

Assignment: Summary

- One assignment consisting of coding tasks
- You submit code as solutions
- You can work in groups
- Pass/fail

What is R?

- R is an open source statistical programming language
- First release in 1995
- Used for data analysis and statistical programming

Why use R?

- Free, open source
- Can easily be extended
- Around 15,000 packages available
- De facto standard in statistics, commonly used in both science and industry
- Tons of R-related things: Books, journals, forums, conferences, ...
- Many methods are already implemented in R

Disclaimer

- R is not the only statistical software and it is fine if you prefer something else
- R can be used in many different ways
- Example: base R vs tidyverse vs data.table vs specialized packages
- I do things in certain ways, and this course will follow that
- This does not mean that the solutions from this course are the only or the best way to do things

What do you need to get started?

- R: https://cran.r-project.org/
- R-Studio: https://www.rstudio.com/