Statistical Computing with R

Lecture 0: introduction and course information

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Mathematical Institute
Leiden University

Master in Statistics and Data Science (2023-2024)


Welcome!
Everything is fine.

Welcome!

Welcome to:

- the Master in Statistics and Data Science
- this course: Statistical Computing with R

And, if you are new to The Netherlands / Leiden...

Welcome!

Welcome to Leiden!

About this course

Statistical Computing with R (6 ECs)

- course designed for the MSc in Statistics and Data Science
- goals: learn to program in R, and to use R for statistical computing and data analysis
- no prior knowledge of R is assumed ☺

Course information and material:

1. general info: Prospectus
2. course material and announcements: Brightspace
3. course and exam enrollment: MyStudyMap

Yours truly

Mirko Signorelli

- Assistant professor of Statistics at the Mathematical Institute
- Office: 221 in the Snellius building
- Main research interests:
  - statistical methods to deal with: high-dimensional data, complex networks, longitudinal data, survival data
  - applications: medicine, biology, genetics; social sciences
- my relationship with `R`:
  - `R` user for $\approx$ 12 years
  - contributed 4 `R` packages to `CRAN`
  - co-organizer of `eRum2020` conference

Timetable & lecture structure

Semester divided in 2 blocks:

- block 1 (Sept-Oct): Wednesday 11.00 - 15.00, Snellius 1.74
- block 2 (Nov-Dec): Thursday 13.15 - 17.00, Gorlaeus EM 1.09

Important ⚠ deviations from this schedule: ⚠

- no classes on 13/9 (= next week), 25/10, 21/12 and 28/12
- extra class on Friday 22/9, 9.00-12.45, Snellius 1.74

Timetable & lecture structure

Each class will comprise two parts:

1. first half: Lecture $\rightarrow$ Mirko
2. second half : Coding Session (practical with exercises) $\rightarrow$ TAs: Vicky, Ben and Martìn

Question hours

- Question hours: additional opportunity to ask questions and get help with `R` and the course content
  1. when: dates and times will be posted on Brightspace
  2. where: office 207 in Snellius
  3. sign up using the form that you will find on Brightspace

E-mails

- E-mails: please send your course-related questions to

  statcompr [at] gmail.com

Netiquette: please use e-mails considerately and sparingly. When possible, ask your questions during lectures, coding sessions and question hours ☺

Books

Recommended readings:

1. chapters 1, 2, 3, 4 and 7 of Braun, W. J., & Murdoch, D. J. (2021). A First Course in Statistical Programming with R. Cambridge University Press.
2. chapters 1, 2 and 14 of Rizzo, M. L. (2019). Statistical Computing with R. CRC Press.

Remarks:

- Braun & Murdoch (2021) main reference for this course
- Numeric optimization (MLE and EM algorithm) discussed towards the end of the course is covered in Rizzo (2019). We will use this book more extensively during the course *Computational Statistics*
- Many more books and online resources on `R` available!

Assignments

Homework during the course:

- assignments that will be published later in this course
- submit your solutions through Brightspace within the deadline

Note the following:

1. assignments are not compulsory and not graded
2. they are an opportunity to practice more with `R` and the course contents
3. the TAs will provide feedback on your submission

Exam

Exams currently scheduled on:

- January 4, 2023
- January 25, 2023 (resit)
- NB: keep an eye on MyStudyMap for possible changes

How will the exam work?

- Exercises similar to those given during the coding sessions
- You write your solutions using R Markdown (pen and paper allowed for parts involving math derivations)
- Bring your own laptop (Windows or MacOS). At the beginning of the exam, you will install a secure app where you can solve your exam using RStudio
- More info about the exam + practice exam during the last lecture of the course

Exam: FAQs

What can I use during the exam?

- ✓ `R`, RStudio, functions' help pages
- ✓ internet: only to install necessary R packages
- ✓ pen & paper (if an exercise involves math derivations)
- ✓ lecture slides without notes

What is not allowed?

- ✗ use exercises and solutions of the practicals, scripts, notes...
- ✗ smartphones, tablets, using internet on laptop
- ✗ copy / ask for help from a fellow student
- ✗ and everything not explicitely allowed in the ✓ list

Exam enrolment

Exam enrolment (Science Faculty procedure)

- you need to
  - enrol for the exam (or, if needed, the resit) using MyStudyMap
  - confirm participation within 10 days from the date of the exam / resit
- Note that we can only admit you to the exam if you are properly registered

So:

- ⚠ make sure you are enrolled for the exam and confirm participation ⚠
- please deregister if you decide to not attend ☺

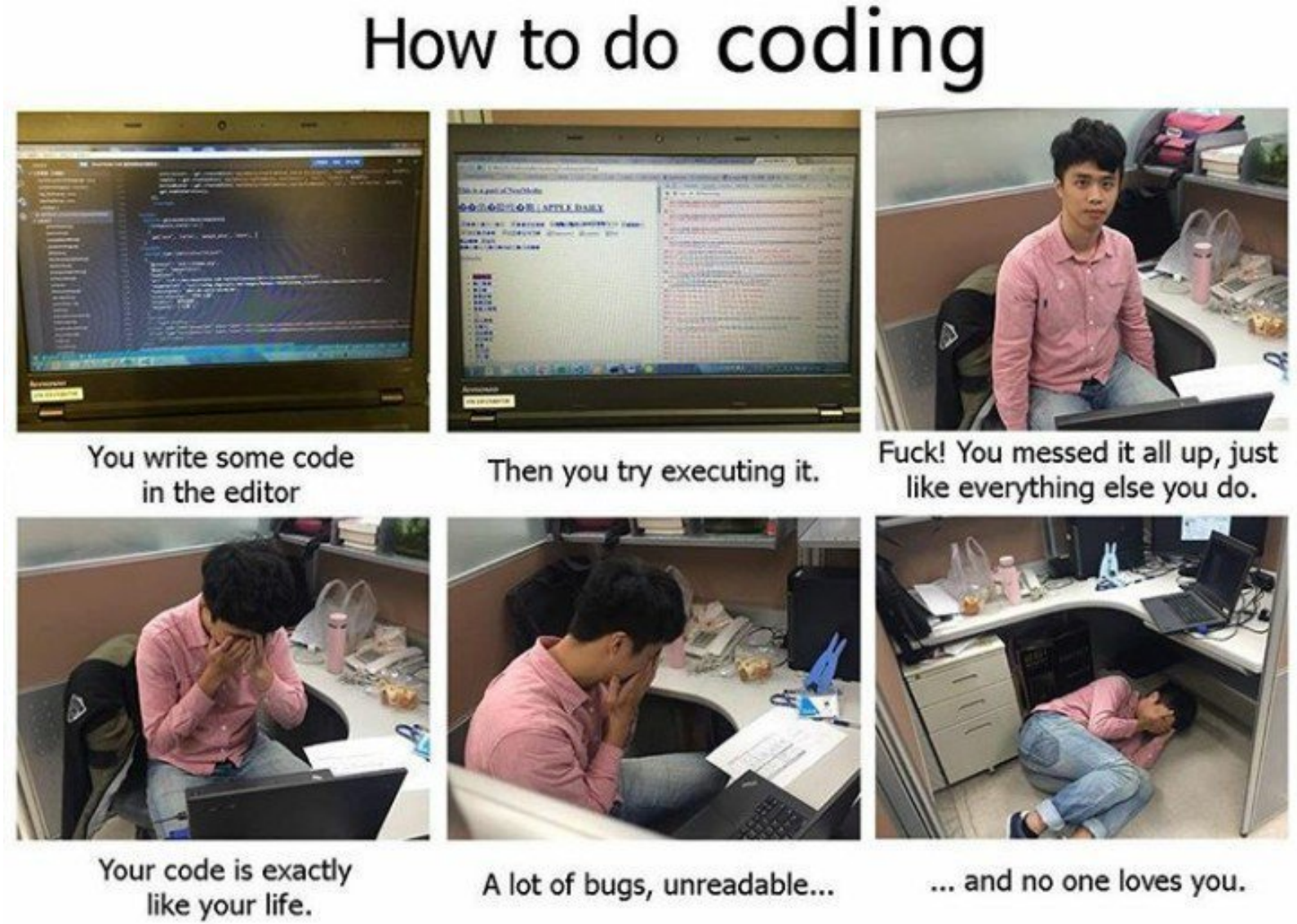
More info about this: Course and exam enrolment

Exam enrolment

Important:

- I regularly receive emails about problems with exam enrolment, however: I do not control this and so I cannot help you with it
- if you have problems with exam enrolment, please contact the Science Student Administration (SSA) at ssa@science.leidenuniv.nl (and, if needed, also the education office at coordinator@stat.leidenuniv.nl)

⚠ WARNING: coding can trigger harmful feelings ⚠



A final remark

Coding is never easy:

- for beginners: steep learning curve
- for expert users: larger & more complex projects, often difficult to debug & fix

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What can make the difference:

- be tidy in your code and files
- don't be afraid to make mistakes
- be proud of the progress you made!