THE UNIVERSITY of EDINBURGH

Data Analysis for Psychology in R (DAPR)

Stats Team

Emma Waterston **Josiah King** **Elizabeth Pankratz** **Umberto Noè**

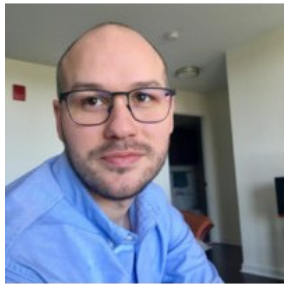
If in doubt:
ppls.psych.stats@ed.ac.uk

Put the name of your course in the subject title, for example:
"DAPR1 – data question"

Lots of lovely tutors!!

Patrick Sturt

Alex Doumas



Zach Horne

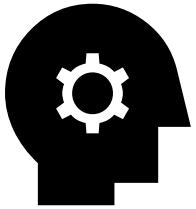
Martin Corley

Aja Murray

Dan Mirman

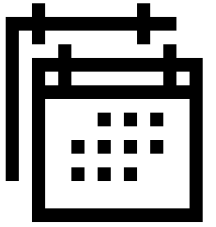
Data Analysis for Psychology in R 1/2/3

summarise, visualise, and make inferences based on data



special focus on methods from psychology research, measuring psychological constructs

tool



course year

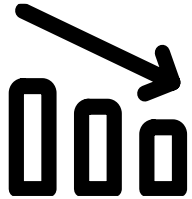
icons from Iconify

“I'm studying psychology, why do I need to learn stats?”

Psychology without stats:

“Mindfulness helped me reduce *my* anxiety, so surely it will work for my patients too.”

Psychology with stats:



“How effective is mindfulness for reducing anxiety, on average? Is it likely that these results are just a coincidence?”

Studying stats will

- help you understand the scientific process
- develop your problem-solving and critical-thinking skills
- open doors for you, both at uni and beyond

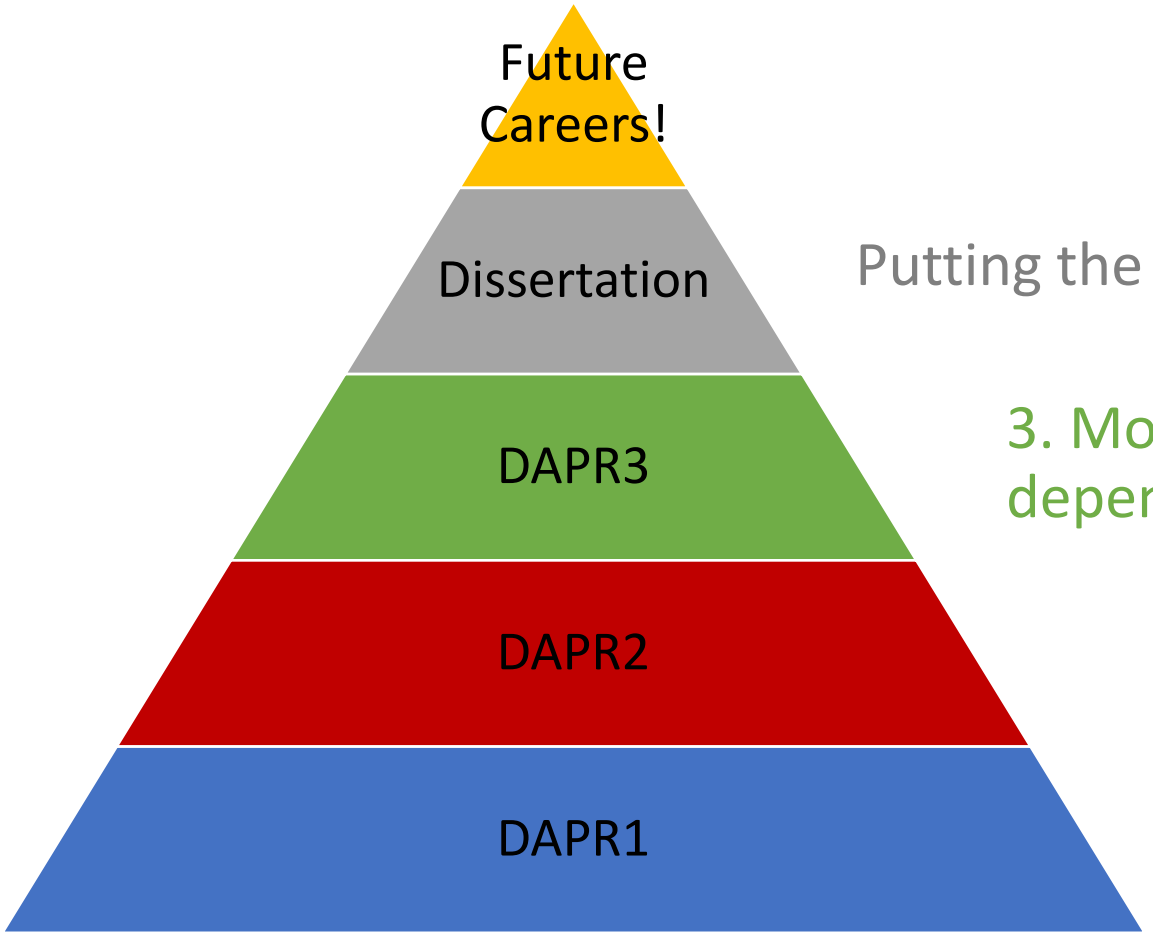
icons from Iconify

Why R ?

- Free and open-source
- Tons of tools for data analysis
- The state of the art for reproducible research and scientific transparency

graphics from tidyverse

The DAPR Curriculum and Your Degree



Putting the tools into practice

3. More advanced models for dependent or survey data

2. Building predictive models for independent data

1. Principles of data visualisation and inference

How Does DAPR Work?

Lectures

- 2 per week (see timetable)
- Content and concepts, plus some live coding demonstrations

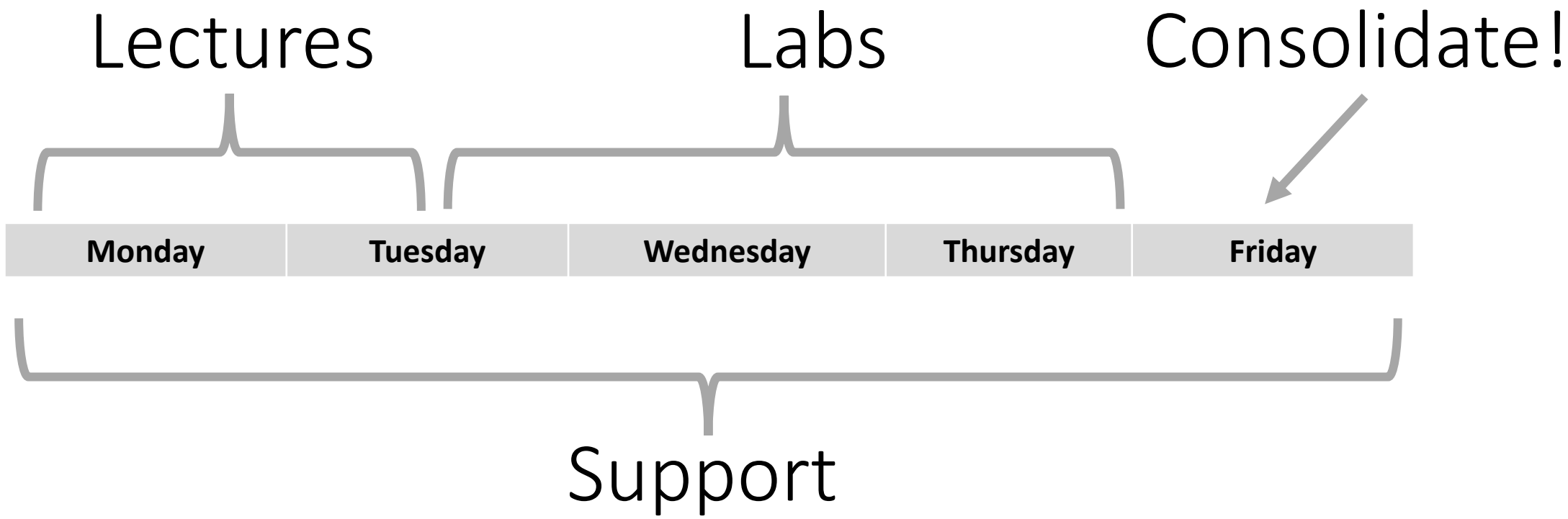
Labs

- a time and place to work on the exercises
- 1 hr per week: be organised, put away distractions
- working in groups
- a team of tutors will be there to help

Support

- lectures: feel free to ask questions
- labs: ask the tutors (they want to help!)
- discussion forums: any time peer-to-peer support
- office hours: see Learn page for details

How Does DAPR Work?



How Does DAPR Work?

Weekly Quizzes 10%

- Released on a Monday at 9am and due on the Sunday at 5pm.
- The feedback and solutions will only be available after the deadline (after Sunday at 5pm)
- No extensions, as these count as continuous summative assessments.
- Late submissions are not possible as solutions are available after the deadline.

Coursework 30%

- Group work
- Analyse a dataset to address specific tasks
- Write up and present your analysis and results

Exam 60%

- Closed book, paper-based
- You will be given an equation sheet so don't worry about having to remember all formulas

Help and Support

- **Labs** (see your personal timetable for the time)
  - Ask tutors for help on R, lab materials, concepts from the lectures
- **Discussion forums** (see LEARN for links)
  - Piazza: A peer-to-peer discussion forum to write questions and get answers from other students.
  - Group Discussion Space: A space to coordinate with each other and contribute to group reports.
- **Office hours**
  - Dedicated hours during which instructors are available to support you and help explain anything unclear about the course content or assessments.
  - Course LEARN page > Course information > Course contacts and office hours
- **Student adviser**
  - Your student adviser (name on Euclid) can support you on anything that is not directly related to the course materials or can refer you to more specialist support.
- **Cohort lead**
  - Your cohort lead (name on Euclid) can support you with academic-related questions, reference letters, and general advice on how to make the most of your time at university.

Course Materials

- Each week's material will be within a weekly folder on LEARN containing:
  - Weekly quiz
  - Lecture slides
  - Lecture activities or readings
  - Lab exercises
- The weekly folders will become available incrementally on LEARN.

LLMs

- LLMs are “bull- 💩 machines”
  - They don’t *know* or *understand* or *think* anything.
  - They are just like your phone's predictive text/auto-complete, but on steroids

- Good when you can verify the output – e.g., “I want my plot to be blue”

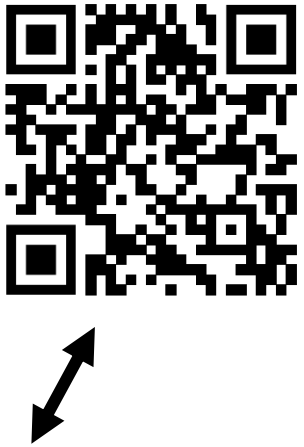
- Not so good if you can’t

https://thebullshitmachines.com/

Our View on AI

- In DAPR, we want you to do the thinking, interpreting, and reporting yourself.
- Learning is hard work, but that hard work now will pay off later in your dissertation (and beyond).
- Work with the humans around you: your peers and the stats team!
  - Your peers are a better resource than any LLM (and explaining concepts to others helps them learn too!).
  - Our job is to help you learn stats. We want you to ask for help.

AI Policy



- Using AI in non-assessed work = ☑
  - e.g., LLMs are sometimes helpful for understanding R documentation.
  - But be aware of the environmental cost (https://www.bbc.co.uk/sounds/play/w3ct6vz4)
- Using AI in assessed work = ✗
  - Do not use LLMs at all in your assessments, including:
    - planning, conducting, or interpreting analyses
    - structuring or formatting a report
    - generating text or code
  - Just like plagiarising from human-written texts, presenting AI work as your own is academic misconduct.
- Engaging with every step of the process yourself is what will help you learn. And learning is why we are all here.

Own-Work Policy

The university's own-work policy applies to the assessments of the DAPR courses.

For group-based reports:

- Avoid plagiarism on reports
- Don't copy/share work between groups
- Don't copy verbatim from the lab materials

Own-work policy also applies to the following:

- Weekly quizzes
- Final exam

The mindset for success in DAPR

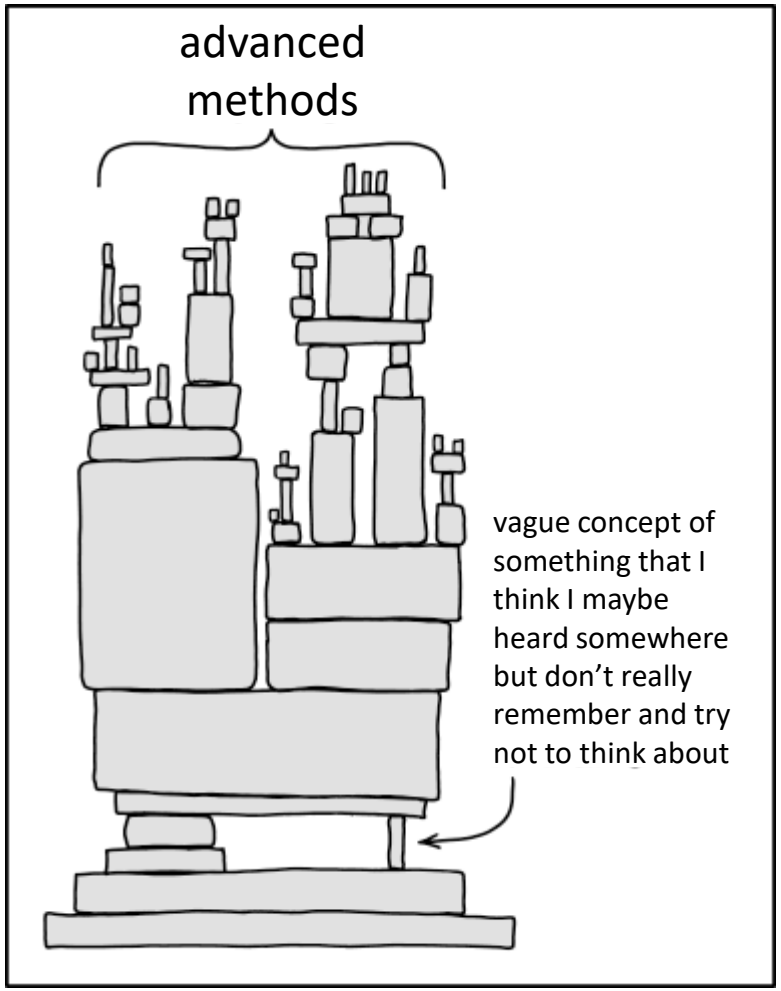
1. Bring a can-do spirit.

2. Mistakes are your friend and teacher.

3. Treat learning stats like learning a new language. Your skills will grow as you use them!

4. By learning a little bit now, you develop your ability to re-learn in the future.

5. It's OK if your foundations are shaky. This is normal. They will get stronger as you learn and re-learn.



Expectations

What the course expects of you

- To work steadily and consistently across the year
- Regular studying and keeping up to date
- Continuous engagement and attendance
- Being proactive and asking for help/support when you need it

What you can expect from us

- We will work hard to help you succeed
- We will be open and communicate with you
- We will be polite, respectful and treat you like adults
- We will never try to trick you or hinder your development

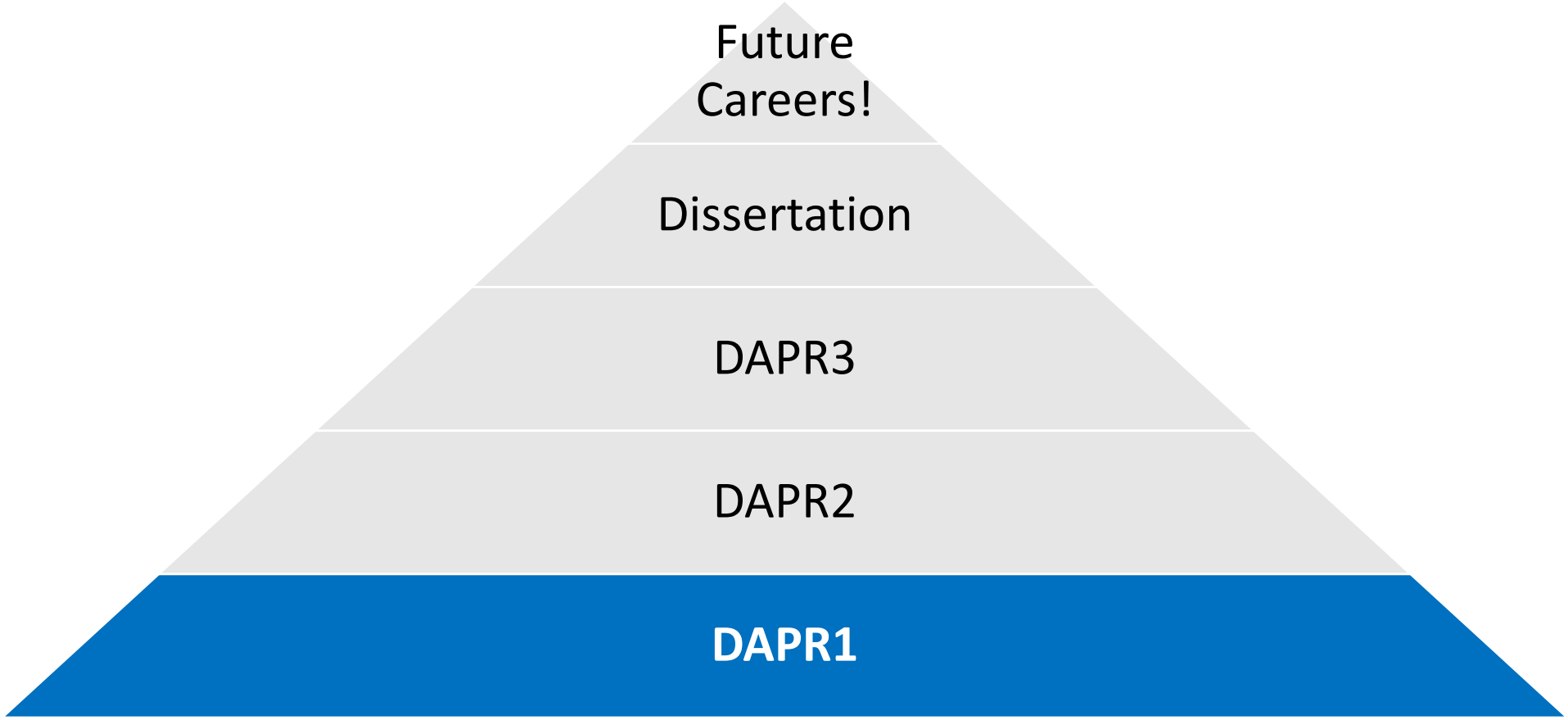
What we expect of you

- You work regularly throughout the year and keep up to date with the materials
- You interact and communicate with the teaching team
- You are polite and respect the teaching team and your classmates
- If you email, include the course name in the subject as some instructors also teach across multiple courses.

Course Introduction

Data Analysis for Psychology in R1 (DAPR1)

DAPR1: Your Foundation for Success in Data Analysis



The DAPR1 Team

Course organisers

- Dr Patrick Sturt
- Dr Umberto Noe

Tutors

- Many knowledgeable and approachable tutors

Course administrator

- Fiona Thomson
  ppls.psych@ed.ac.uk

Instructors

Dr Patrick Sturt
(in Block 1)

Dr Alex Doumas
(in Block 2)

Dr Umberto Noe
(in Block 3)

Dr Emma Waterston
(in Block 4)

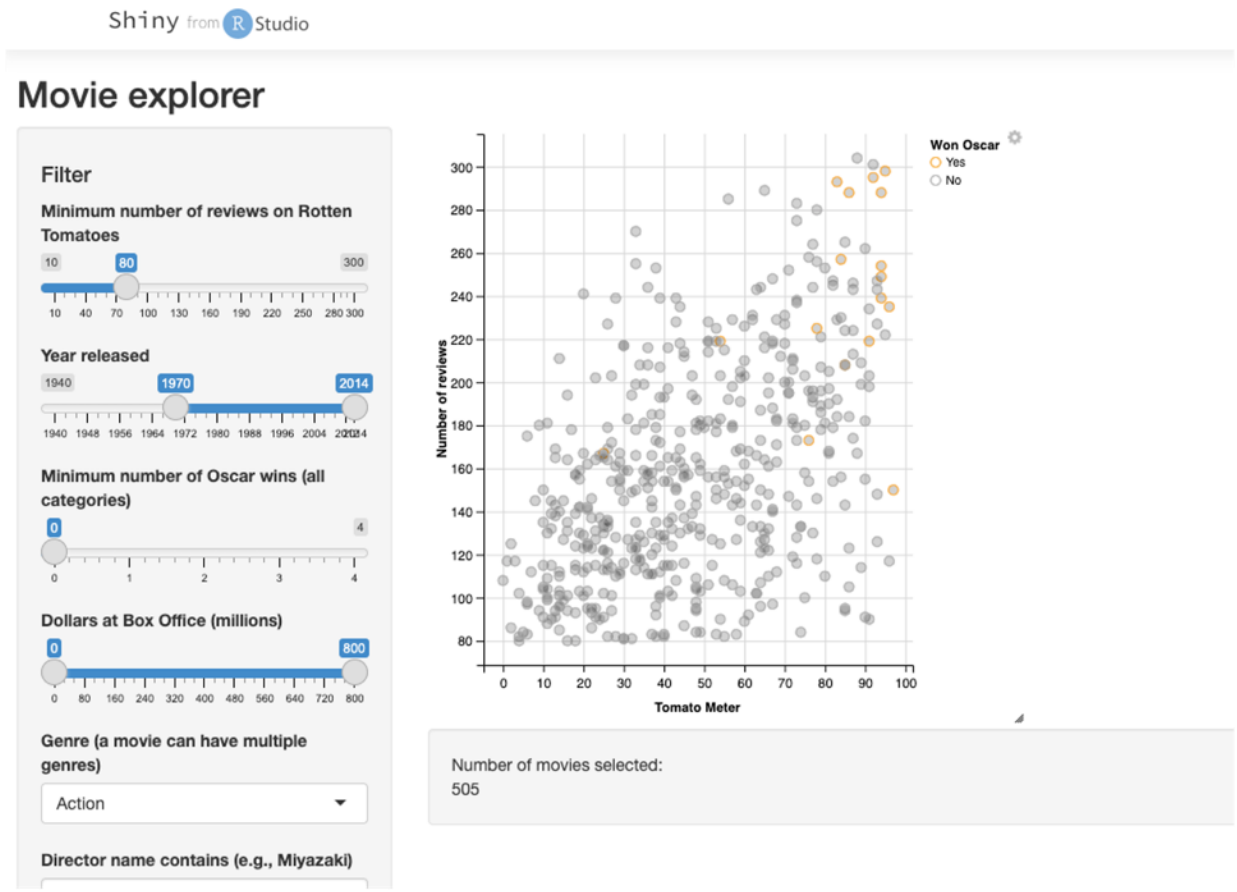
Course Aims

- Build the core data and R skills at a slow and steady pace.
- Introduce key statistical concepts.
- Help you develop an effective approach to studying data analysis.
- Encourage you as a cohort to be collaborative, supportive peers.
- Integrate with Psychology 1A and 1B.

The R in DAPR1

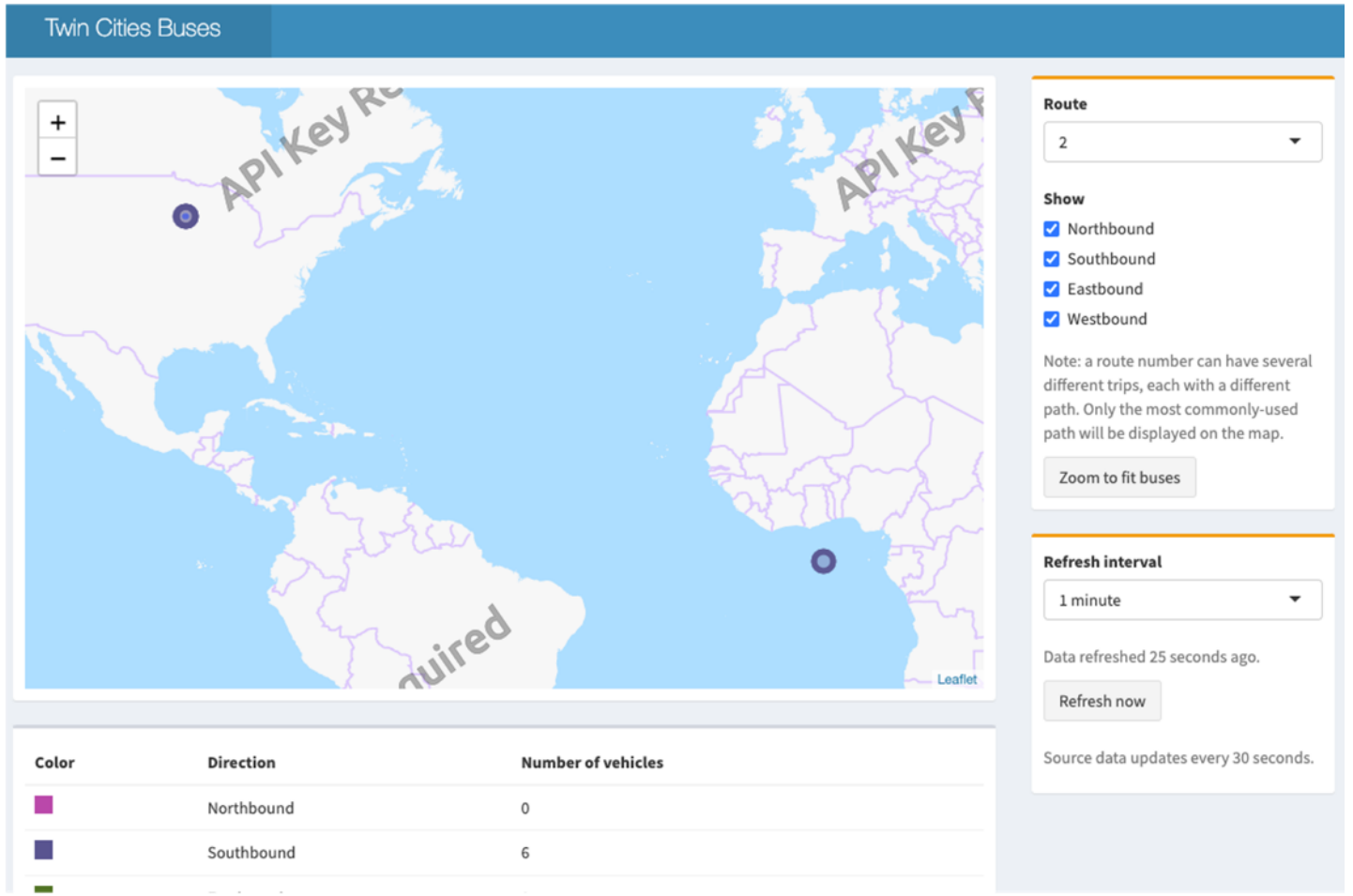
- **R** is the name of a very *flexible* and *free* programming language for working with data
  - It does pretty much any statistical analysis you can think of
  - But it does a lot more…

Interactive Plots



For example: https://shiny.rstudio.com/gallery/movie-explorer.html

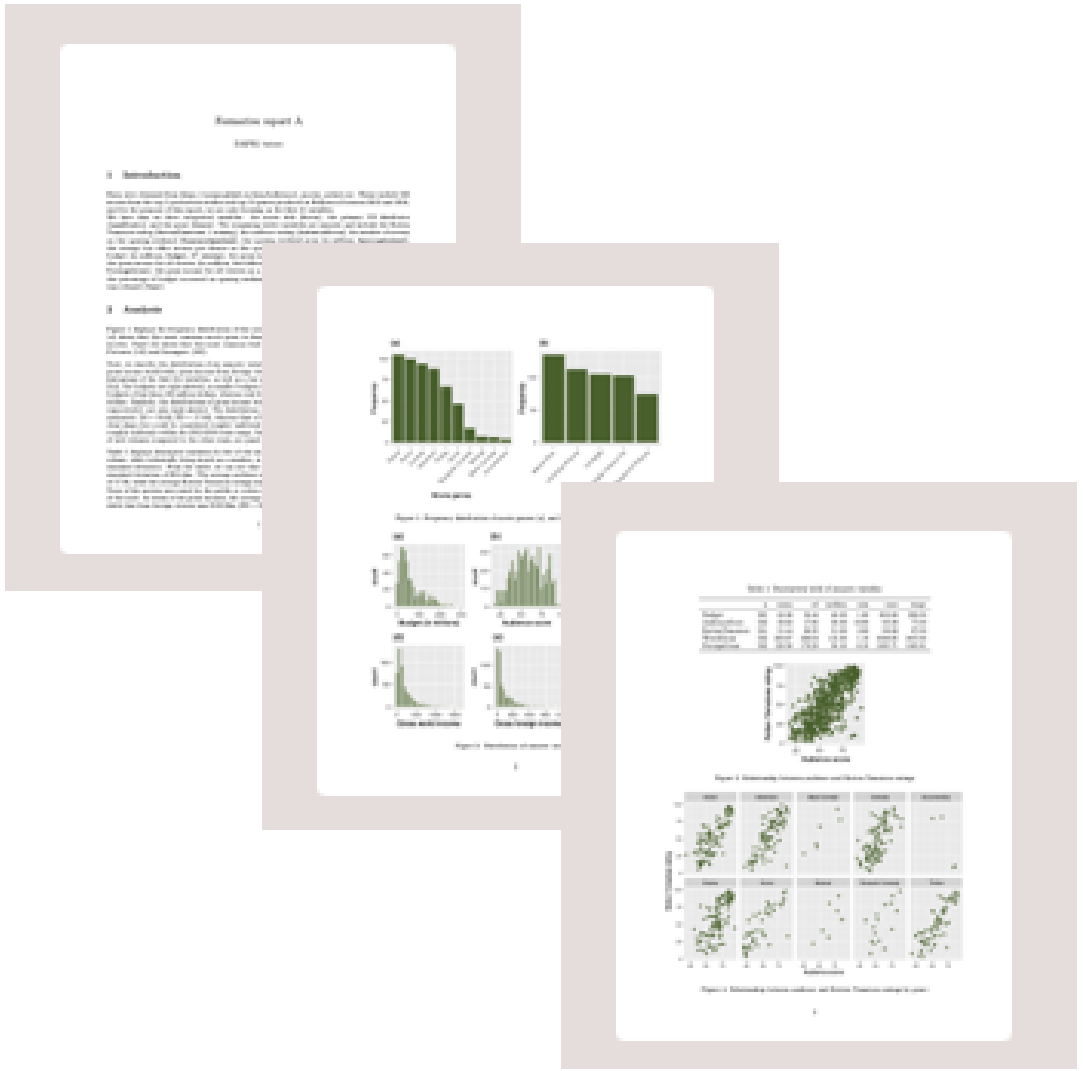
Interactive Dashboards



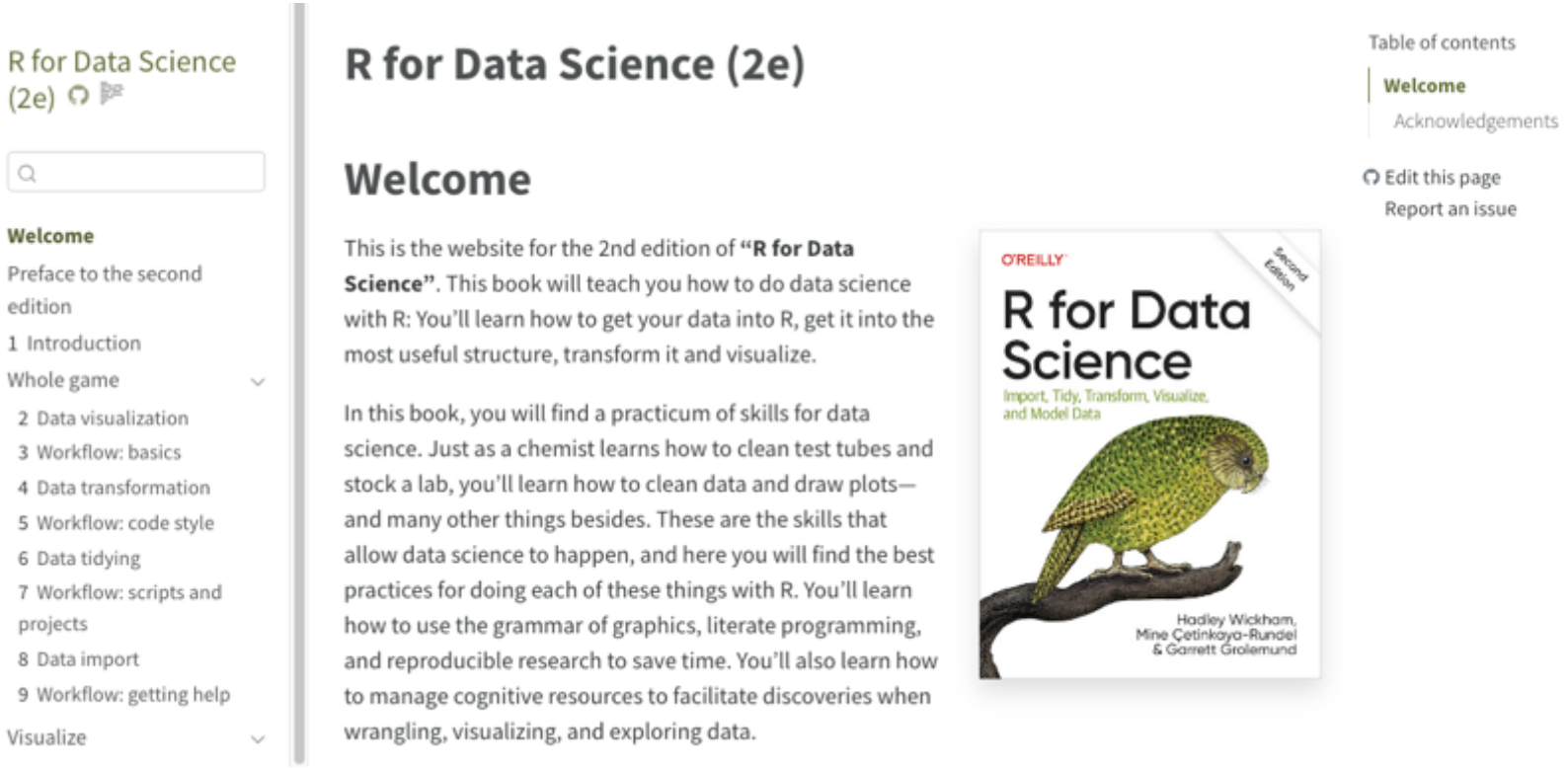
For example: https://gallery.shinyapps.io/086-bus-dashboard/

Reports

- Documents which automatically include results from analysis
- We will create these in the labs

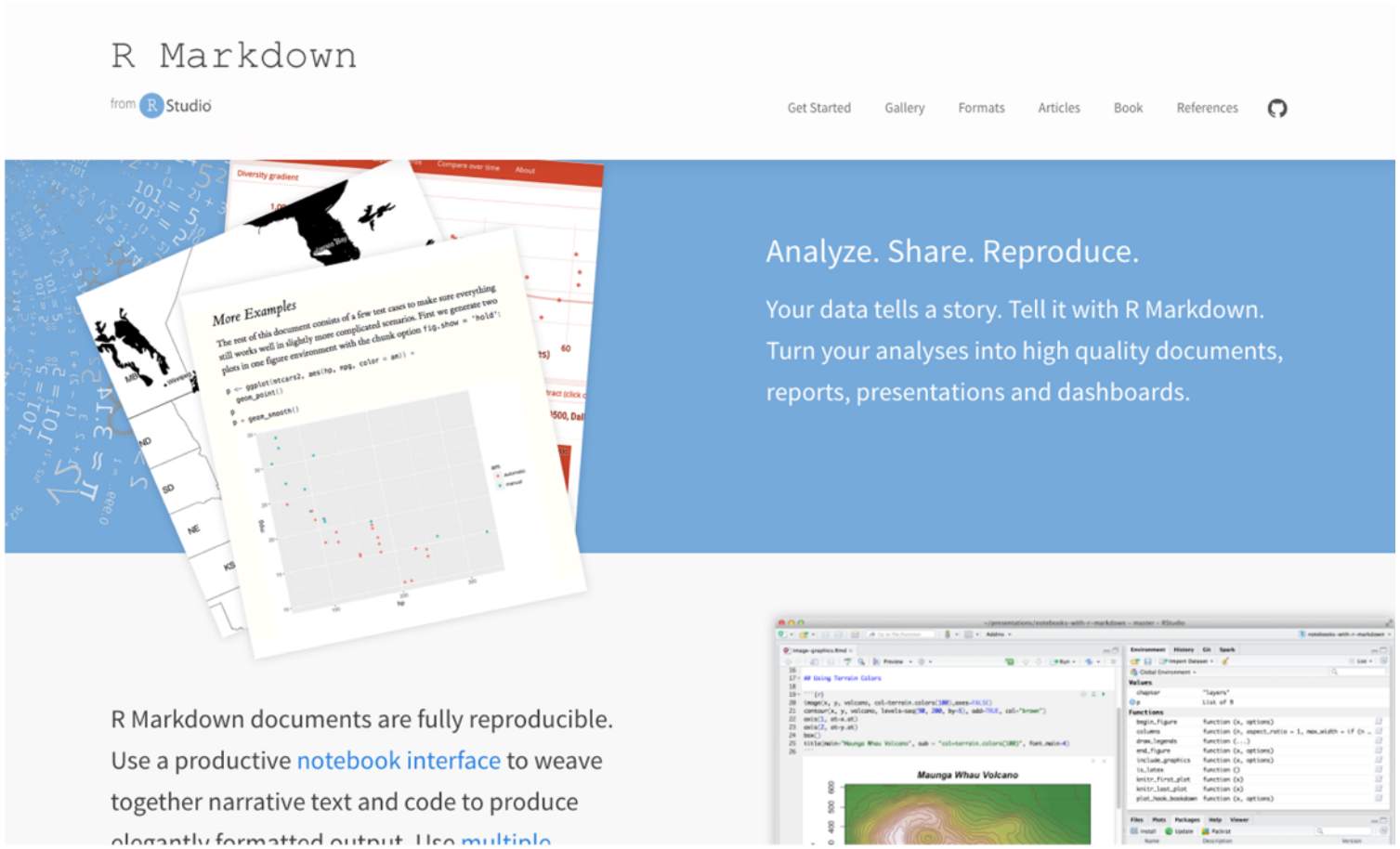


Books



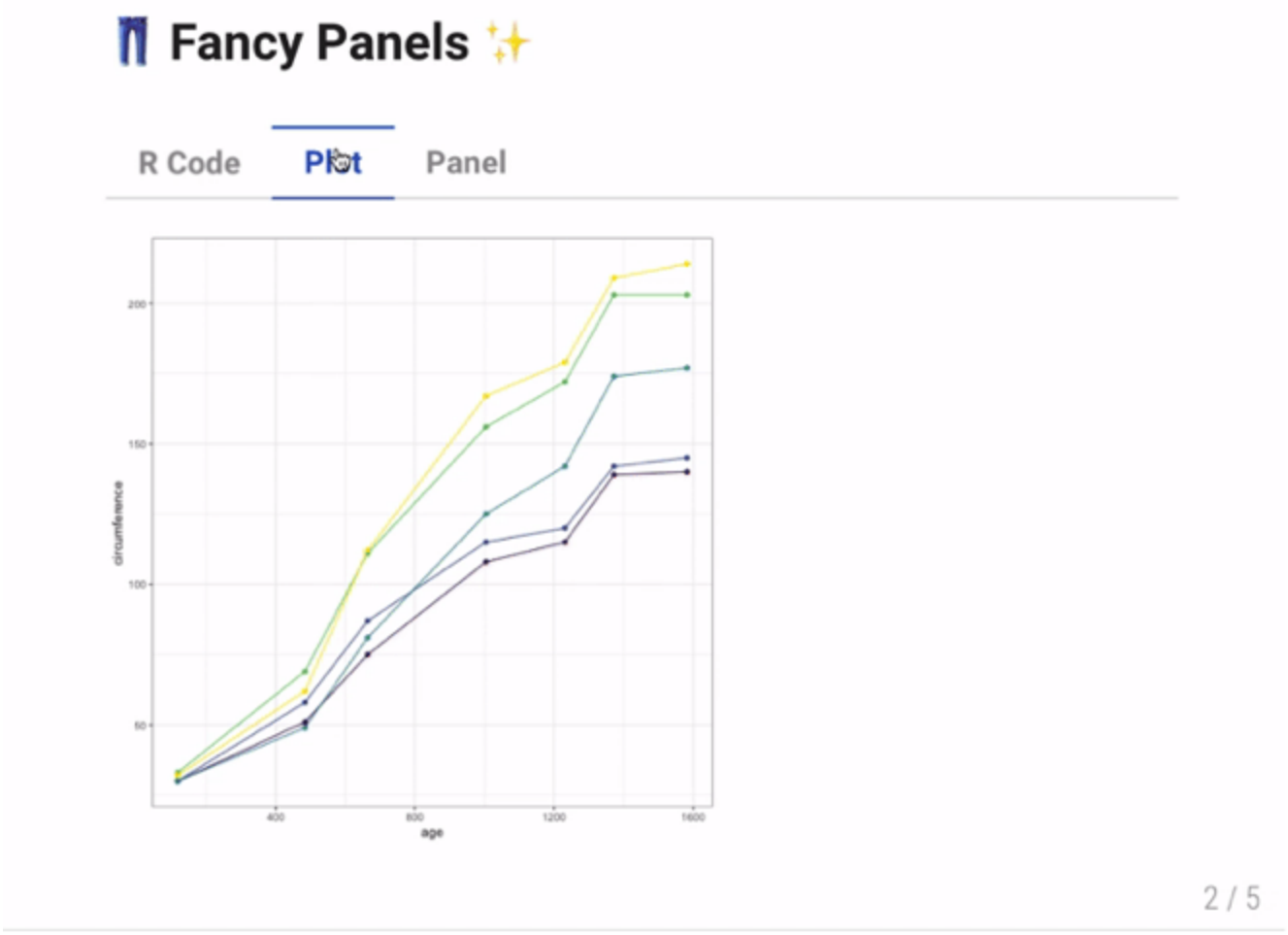
For example: https://r4ds.hadley.nz/

Websites



For example: https://rmarkdown.rstudio.com/

Presentations



Lab Structure

- The course has 4 labs each week, and you have been allocated to attend one lab per week.
  - See your personal timetable for which one to attend.
- Within each lab, you will work in groups (one group per table) of **at most 5 students**.
- In each group:
  - One person is the "**driver**" – responsible for typing on the PC for that week
  - The rest are the "**navigators**" – responsible for commenting on the strategy, spotting and fixing typos or coding errors
  - The driver will rotate each week.

Lab Structure

- Group-based work in preparation of the assessed report in Sem. 2
    - As a group, you will create 3 formative reports (two in Sem. 1, one in Sem. 2) for which you will receive feedback
    - To help you build study skills, the course has a specific assessment structure which integrates multiple formative assessments. This creates an iterative improvement path.
- One group per table, each group has a name
    - Take note of the group name
    - For example, Lab 1 has Group 1.A, Group 1.B, Group 1.C, Group 1.D, …
    - During your first lab you must self-register for the group with that name on LEARN.

Lab Pedagogy

- **Based on novel educational practice and informed by student feedback**
  - Pair programming principles (driver vs navigators)
  - Group work
  - Assessment for learning with formative feedback
- **Modern and inclusive lab materials that respect diverse learning communities**
  - Multiple layers of support
    - Peer-to-peer
    - Hints
    - Worked Example
    - Tutor Explanation
    - Office Hours
  - Extra examples on R code
  - Color contrast accessibility also available

Course Contents

Block 1: Exploratory data analysis
Semester 1, Weeks 1-5

- Covers topics such as collecting, handling, visualising, and summarising data. Gets you started with R, the software we will use to analyse data. This represent the starting point of data analysis.

Labs: Formative report A

Block 2: Probability
Semester 1, Weeks 7-11

- Represents the bridge between exploratory data analysis and inference. Introduces probability and distributions, with particular attention to the normal probability distribution, which arises in many everyday situations. It builds on those concepts to introduce sampling distributions, which show the variability of quantities like the mean from sample to sample.

Labs: Formative report B

DAPR1

Block 3: Inference
Semester 2, Weeks 1-5

- Introduces the step-by-step process of testing a research hypothesis and focuses on explaining in depth the meaning of each component of a test of hypothesis.

Labs: Formative report C

Block 4: Common hypothesis tests
Semester 2, Weeks 6-10

- Teaches widely used hypothesis testing procedures that are used in everyday research to answer specific questions about a population.

Labs: Assessed report

Assessment Dates/Information

Weekly Quizzes (10%)

- Released: Mondays at 9am
- Due: Sundays at 5pm (feedback & solutions released after this)
- Best 14/18 quizzes count (first two quizzes are practice)
- No extensions (these are continuous summative assessments)

Assessed Report (30%; group-based)

- Done in the labs of weeks 6-10 of semester 2
- Due: 27 March 2026, 12 noon
- Preparation: Multiple opportunities to practice during the labs, where you will create 3 formative reports in blocks 1, 2, and 3.

Exam (60%)

- April/May Exam Diet
- 60 multiple choice questions; paper-based; in-person; closed book
- Centrally Timetabled. Exact date is not known to instructors in advance.
- Preparation: Online mock exam session in week 11 of semester 2

Tasks for Welcome Week

Go to the **Course LEARN page** > click **Course materials: Semester 1** > click **S1 Welcome Week: DAPR1 Starts Here!** and complete the **Tasks**:

- Watch the **Course Overview** video (this one) ☑
- Read the **Course Information** folder
- Read the **Assessment** > **Assessment and Feedback Information** page
- Register for the **RStudio server online**
- (Over the next few weeks) watch the **RStudio Server overview** video

Welcome to the course!