

Introduction to R Programming

Date: 12th March 2018

Location: Room B, Wellcome Centre for Human Genetics

Tutors: Helen Lockstone and Ben Wright (Bioinformatics Core)

Course Overview

This course is aimed at those who would like an introduction to using R statistical software, and will assume no prior experience in programming or R itself. The format is one day of introductory teaching and a follow-up workshop session with tutors on hand to provide guidance and answer questions. For both teaching and workshop days, please bring your own laptop with the R software (<https://www.r-project.org/>) and RStudio interface (<https://www.rstudio.com/products/RStudio/>) installed, and also an Eduroam account for internet access (<http://help.it.ox.ac.uk/network/wireless/services/eduroam/index>).

The course will be held at Wellcome Centre for Human Genetics (Old Road Campus). Light refreshments will be provided and lunch can be purchased in the on-site canteen.

Course material and further resources including some guidance notes are available at http://www.well.ox.ac.uk/bioinformatics/training/Introduction_to_R/

Schedule – Monday 12th March 2018

10:00 – 10:15	Welcome and introductory remarks
10:15 – 11:00	Getting started with R and RStudio
11:00 – 11:15	Coffee Break (refreshments provided)
11:15 – 11:45	Data Types and Structures
11:45 - 12:30	Handling and Analysing Data in R (guided tutorial)
12:30 – 13:30	Lunch break
13:30 – 14:00	Overview of loops and functions
14:00 - 15:00	Working through online tutorial (own pace)
15:00 – 15:15	Break
15:15 – 16:00	Optional session to continue working through tutorial

Course Material

We will use a mixture of lecture slides and an open source online tutorial ‘Introduction to R Programming’ provided by the Software Carpentry Foundation (<https://software-carpentry.org/about/>) as the basis for this course. You can find the tutorial at <http://swcarpentry.github.io/r-novice-inflammation/> - we have selected certain topics from it and suggest they are covered in the following order:

R Fundamentals

Introduction to RStudio
Analysing Patient Data
Addressing Data*
Reading and Writing CSV Files
Data Types and Structures
Understanding Factors

Advanced topics

Analysing Multiple Datasets
Loops in R*
Creating Functions
Best Practices for Writing R
Making Choices

*These topics are supplementary to material introduced in the preceding one and can be skipped or revisited at a later date.

We will cover the first two topics, Introduction to RStudio and Analysing Patient Data, during the first day of teaching as a guided group tutorial and use this to introduce many concepts of programming in R. The subsequent topics can be followed at your own pace in the latter part of the taught day and at the follow-up workshop. It would also be helpful to spend some time on it between the sessions to absorb the new information. In total, it may take around 2-3 full days to complete. Some of the advanced topics contain quite complex material and problems to solve – you may find it easier to re-visit some of these topics when you are more familiar with general aspects of R as a programming language.

Workshop sessions

After the introductory day, you will be able to attend a workshop session to continue working through the online tutorial with assistance from the tutors. These will be held for groups of around 10-15 people to enable plenty of one-to-one help and interaction. Workshop sessions will be run in the week or two after the teaching, and you can sign up when attending the first part of the course.