

# QUEEN MARY, UNIVERSITY OF LONDON

## MTH6102: Bayesian Statistical Methods

### Practical 1

2023-2024

## Introduction to R

R is a free program, which is quickly becoming the standard for statistical computing, especially in research. It is developed by the R Development Core Team, who are based at universities and research institutes throughout the world. For more information, see the [R website](#). The same information is available at several [mirror sites](#). Choosing a nearby one for downloading will save time.

This file has a brief introduction to R, and then the R code file **Practical 1 R code.R** has a series of suggested commands to look at. There are some examples of simple uses of the commands given, but please try other examples and look in the help files for the commands to see other options for their use.

## R in Queen Mary

R should be installed on the Queen Mary computers by default. In Windows, in the list of installed apps, it is called R GUI. Clicking this opens up the R GUI. It may also appear elsewhere in the list with a different name, as the computers have more than one version of R installed. Just searching the list of apps for “R” may not find R, but searching for “R Gui” should.

RStudio also appears in the same list of apps. This is an interface to R which you might prefer the appearance of.

## Installing R

To install R on your own computer, you can download the latest version a nearby [mirror site](#). For Windows, click on **Download R for Windows** in the **Download and Install R** box: then on the next page, select **base**. Choose the most recent version of the software and save the corresponding file to disk. When this is done, double click on the `exe` file to install R. Using the default installation options should be fine. Versions for Linux and Mac are also available.

RStudio can also be [downloaded](#) and installed for free. Choose RStudio desktop, and then the correct Windows, Mac or Linux version.

RStudio needs R to be installed as well in order to use it, as it is just an interface to R.

## First steps

Either open R or RStudio. R is a command line based environment (whether using R or RStudio) and the only menus you are ever likely to use is the **Help** menu plus the menu for installing packages. The R **console** window shows the output of commands and also allows you to enter simple commands. Where you see the `>` symbol, R is waiting for a command.

A simple use of R is as a calculator. Type some arithmetic expression, such as `2+3`, and press **Enter**. There are many simple functions with an obvious syntax, e.g. `log(5)`, `sqrt(16)`, `sin(pi/2)` and so on. Try a few more.

## R help

There are several ways to get help in R. If you know the name of a command such as “log”, you can type either `help(log)` or `?log`. The help is intended to be comprehensive and is not always easy to use, especially when you are new to R. The examples are often more useful.

If you don't know the name of a command, you can use `help.search` with a word or phrase in quotations, e.g. `help.search("logarithm")`, or `??logarithm`. These options also appear under the **Help** menu, as **R functions (text)** and **Search help** respectively, along with links to the manuals and various other forms of help.

## Scripts

For experimenting with commands, the console mentioned above is helpful, but otherwise it is good practice to enter commands using a script, so that you have a record that you can save, and run again or modify later. In the **File** menu, choose **New script**. In RStudio, to open a new script, from the **File** menu, select **New file**, then **R script**.

This opens another window which you can type commands into. To run a command, select one or more lines that you want to run and then click **CTRL+R** in the R GUI, or **CTRL+ENTER** in RStudio.

Scripts are saved using the extension `.R`. There is also a menu option in R **File -> Open script** to open an existing script such as the file **Practical 1 R code.R**. In RStudio, there is a more general **File -> Open file** option.