

A minimalistic introduction to R

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This document recycles tutorials written by Koen van Benthem and Tina Cornioley

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We do not claim to teach you the most efficient way to use R. If you at some point during the computer practicals encounter a code that you could make more efficient or elegant, please do let us know!

However, do try to understand exactly what we are doing and how the functions we use work. The best way to learn how functions work is by either using the R-manual (type `?functionname` or use the RStudio Help tab by clicking on it or pressing F1) or by creating dummy data (just make up a small amount of data yourself, using R if possible!) and analyse what the function does to this data.

How this document works

This is a `knitr` document, which knits R code and output within a \LaTeX document. R code and output is generally contained within boxes with a gray background. Comments within the R code start with a `#` symbol; lines with R-outputs start with `##`.

1 Trash your calculator

R can be used as a calculator, and a far more powerful one than any physical calculator. If you use your calculator to enter numbers in R, you are being inefficient.

Below we demonstrate the use of some basic mathematical operators:

```
1+3 #addition

## [1] 4

5-2 #subtraction

## [1] 3

6*4 #multiplication

## [1] 24

14/2 #division

## [1] 7

2^3 #exponent

## [1] 8

2**3 #or equivalently

## [1] 8
```

There are many mathematical functions already present in R:

```
exp(3) #exponential

## [1] 20.08554

log(2.71) #logarithm

## [1] 0.9969486
```

```
sqrt(9) #square root, which of course you can also write as:
```

```
## [1] 3
```

```
9 ^ (1/2)
```

```
## [1] 3
```

```
sin(pi/2); cos(1); tan(pi/3) #trigonometric functions
```

```
## [1] 1
```

```
## [1] 0.5403023
```

```
## [1] 1.732051
```