

# R Reference Card

## Recap: Introduction to R



Dr. Osama Mahmoud (*o.mahmoud@bristol.ac.uk*)

This R reference card is a part of the course:  
**Introduction to Data Visualisation & Web-applications Using R**

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### Getting help

`help.start()` show the help system  
`help("fun.name")` a function documentation  
`?fun.name` a function documentation  
`help.search("phrase")` search for a phrase

### Arithmetic operations

`+`, `-`, `*`, `/` basic arithmetic operations  
`**`, `^` power signs  
`pi` the number  $\pi$   
`Inf`, `-Inf`  $\pm \infty$   
`%%` integer division  
`%%` modulo (remainder from the division)  
`NA` not available (missing value)  
`NaN` not a number  
`NULL` empty object

### Logical operators

`==`, `!=` is it equal, not equal?  
`!` not (negation operator)  
`>`, `>=` greater than, greater than or equal to  
`<`, `<=` smaller than, smaller than or equal to  
`&`, `&&` logical and  
`|`, `||` logical or  
`xor` exclusive or  
`TRUE` or `T` true  
`FALSE` or `F` false  
`any()` is at least one element true?  
`all()` are all elements true?  
`which()` indices of true elements

### Simple functions

`exp()` exponential  
`log()`, `log10()` and `log2()` logarithm base e, base 10 and base 2  
`max()`, `min()` extreme values  
`abs()` absolute value  
`sqrt()` square root  
`sum(, na.rm=T)` sum excluding missing values  
`prod(, na.rm=T)` product excluding missing values  
`round()`, `floor()`, `ceiling()` round (down/up)  
`sin()`, `asin()`, `cos()`, `acos()`, `tan()`, `atan()` trigonometric functions

### Vectors and matrices

`c()` create a vector  
`length()` length of a vector  
`matrix()` create a matrix  
`t()` matrix transpose  
`dim()` dimension of a matrix  
`%*%` matrices multiplication  
`factor()` or `as.factor()` create a factor (Categorical data)

### Characteristics of data objects

`objects()`, `ls()` show a list of defined objects  
`typeof()` data type of an object  
`mode()` mode of an object  
`class()` class of an object  
`str()` structure of an object

### Working with data structures

`data.frame()` create a data frame  
`list()` create a list  
`is.numeric()`, `is.character()`, ... Is a vector numeric/character/ ... ?  
`as.numeric()`, `as.character()`, ... convert data type  
`is.na(x)` Does x contain NA elements?  
`is.null(x)` Is x an empty object?

### Handling data

`head(M)`, `tail(M)` show first/last part of an object M  
`sort(x)` sort a vector x  
`rep(x, times=, each=)` replicate x  
`seq(from=, to=, by=)` create a sequence  
`sample(x, size=, replace=)` draw a random sample from x  
`na.omit()`, `na.exclude()` remove missing values  
`x[a]`, `x[-a]` select elements from a vector x by their indices  
`M[a,]`, `M[,b]` select elements of row a/ column b from M  
`rbind()` Concatenating data by row  
`cbind()` Concatenating data by column  
`merge()` merge data by common columns or rows  
`rownames(M) <- c()` set row names for M  
`colnames(M) <- c()` set column names for M