Parentheses are for functions, brackets are for indicating the position of items in a vector or matrix. (Here, items with numbers like \(x_1\) are user-supplied variables.)

Miscellaneous

- \(q()\): quit
- \(<-\): assign
- \(\text{install.packages("package1")}\): install package1
- \(m1[,2]\): column 2 of matrix \(m1\)
- \(m1[,2:5]\) or \(m1[,c(2,3,4,5)]\): columns 2–5
- \(m1\$a1\): variable \(a1\) in data frame \(m1\)
- \(\text{NA}\): missing data
- \(\text{is.na}\): true if data missing
- \(\text{library(mva)}\): load (e.g.) the mva package
- \(\text{help(command1)}\): get help with command1
- \(\text{help.start()}\): start browser help
- \(\text{help(package=mva)}\): help with (e.g.) package mva
- \(\text{apropos("topic1")}\) and \(\text{help.search("topic1")}\): commands relevant to topic1
- \(\text{example(command1)}\): examples of command1

Input and output

- \(\text{source("file1")}\): run the commands in file1
- \(\text{read.table("file1")}\): read in data from file1
- \(\text{scan(x1)}\): read a vector \(x1\)
- \(\text{download.file("url1")}\): from internet
- \(\text{url.show("url1")}\), \(\text{read.table.url("url1")}\): remote input
- \(\text{sink("file1")}\): output to file1, until \(\text{sink()}\)
- \(\text{write(object1, "file1")}\): writes object1 to file1
- \(\text{write.table(dataframe1, "file1")}\): writes a table

Managing variables and objects

- \(\text{attach(x1)}\) \(\text{detach(x1)}\): put (remove) \(x1\) in search path
- \(\text{ls()}\): lists all the active objects.
- \(\text{str(object1)}\): print useful information about object1
- \(\text{rm(object1)}\): remove object1
- \(\text{dim(matrix1)}\): dimensions of matrix1
- \(\text{dimnames(x1)}\): names of dimensions of \(x1\)
- \(\text{length(vector1)}\): length of vector1
- \(1:3\): the vector 1, 2, 3
- \(c(1,2,3)\): creates the same vector
- \(\text{rep(x1,n1)}\): repeats the vector \(x1\) \(n1\) times
- \(\text{cbind(a1,b1,c1)}, \text{rbind(a1,b1,c1)}\): binds columns or rows into a matrix
- \(\text{merge(df1,df2)}\): merge data frames
- \(\text{matrix(vector1,r1,c1)}\): make vector1 into a matrix with \(r1\) rows and \(c1\) columns
- \(\text{data.frame(v1,v2)}\): make a data frame from vectors \(v1\) and \(v2\)
- \(\text{as.factor()}, \text{as.matrix()}, \text{as.vector()}\): conversion
- \(\text{is.factor()}, \text{is.matrix()}, \text{is.vector()}\): what it is
- \(\text{which(x1==a1)}\): returns indices of \(x1\) where \(x1==a1\)

Control flow

- \(\text{for (i1 in vector1)}\): repeat what follows
- \(\text{if (condition1)} \ldots \text{else} \ldots \text{conditional}\)

Arithmetic

- \(\%\%\): matrix multiplication
- \(\%/\%, ~, \%/\%\): integer division, power, modulus, square root

Statistics

- \(\text{max()}, \text{min()}, \text{mean()}, \text{median()}, \text{sum()}, \text{var()}\): as named
- \(\text{summary(data.frame)}\): prints statistics
- \(\text{rank()}, \text{sort()}\): rank and sort
- \(\text{ave(x1,y1)}\): averages of \(x1\) grouped by factor \(y1\)
- \(\text{by()}\): apply function to data frame by factor
- \(\text{apply(x1,n1,function1)}\): apply \(function1\) (e.g. mean) to \(x\) by rows (\(n1=1\)) or columns (\(n2=2\))
- \(\text{tapply(x1,list1,function1)}\): apply \(function1\) to \(x1\) by \(list1\)
- \(\text{table()}\): make a table
- \(\text{tabulate()}\): tabulate a vector

basic statistical analysis

- \(\text{aov()}, \text{anova()}, \text{lm()}, \text{ glm()}\): (generalized) linear models, anova
- \(\text{t.test()}\): t test
- \(\text{prop.test()}, \text{binom.test()}\): sign test
- \(\text{chisq.test(x1)}\): chi-square test on matrix \(x1\)
- \(\text{fisher.test()}\): Fisher exact test
- \(\text{cor(a)}\): show correlations
- \(\text{cor.test(a,b)}\): test correlation
- \(\text{friedman.test()}\): Friedman test
- \(\text{prcomp()}\): principal components
- \(\text{factanal()}\): factor analysis
- \(\text{kmeans()}\): kmeans cluster analysis
- \(\text{correlation()}\): canonical correlation

Graphics

- \(\text{plot()}, \text{barplot()}, \text{boxplot()}, \text{stem()}, \text{hist()}\): basic plots
- \(\text{matplot()}\): matrix plot
- \(\text{pairs(matrix)}\): scatterplots
- \(\text{coplot()}\): conditional plot
- \(\text{stripplot()}\): strip plot
- \(\text{qqplot()}\): quantile-quantile plot
- \(\text{qqnorm()}, \text{qqline()}\): fit normal distribution