One Page R Reference Card

Alexey Shipunov, July 10, 2018

`c(a, b)`: concatenate, vectorize `#` comment char
`install.packages("package1")`: install package `package1`
`is.na(x1)`: `TRUE` if `x1 == NA`
`library(package1)`: load package `package1`
`NA`: missing value `3e3`: $3 \times 10^3 = 3000$ (e-notation)
`options(scipen=100)`: get rid of e-notation
`<-` or `assign()`: assign
`q("no")`: quit R, do not save environment
`history(Inf)`; `savehistory(file1)`: look on command history; save history (not on macOS GUI)
`;` used to separate commands `::` used as `package::command()`
`Tab`; `Up`; `Ctrl+U`: complete; repeat command; delete command (not on macOS GUI)

Help

`example(com1)`: run examples for command `com1`
`help(com1)` or `?com1`: help about command `com1`
`help(package=rpart)`: help for the package, e.g. `rpart`
`function1`; `methods(function2)`; `getAnywhere(method2)`: look on the `function1` and 2 codes
`??"topic1"`: finds `topic1` in all help files (slow!)

Entering and saving data

`dir(...)` and `setwd()`: list files in directory, go to another
`read.table("file1", h=T, sep=";", as.is=T)`: read data into data frame from `file1` which has header and semicolon as separator; do not convert variables into factors
`scan("file1", what="char"`: read one series of character codes from disk into variable
`sink("file1", split=TRUE)`: output to `file1` and to the terminal until `sink()`
`source("file1.r")`: run commands from file `file1.r`
`write.table(x1, "file1")`: write object `x1` to the file `file1`

Manage variables and objects

`1:3` or `c(1, 2, 3)`: **c**oncatenate `1, 2, 3` into vector
`as.data.frame(x1)`, `as.matrix(x1)`: conversion
`cbind(a1, b1, c1)` or `rbind(a1, b1, c1)`: join columns or rows into matrix
`cut(v1, 2, labels=c("small", "big"))`: split vector `v1` in two intervals
`data.frame(v1, v2)`: list from same-length vectors `v1` and `v2`
`df1$a1`: variable (column) named `a1` from data frame `df1`
`dimnames(mat1)`, or `names(df1)` and `row.names(df1)`: names of rows and columns of `mat1` or `df1`
`droplevels(factor1)`: drop unused factor levels
`grep("str1", x1)`: search `str1` in `x1`
`gsub("str1", "str2", x1)`: replace `str1` to the `str2` in `x1`
`head(df1)`: first rows of data frame
`length(v1)`, `nrow(mat1)`, `ncol(df1)`: sizes
`list1[[-5]]`: all list elements except 5th
`ls()`: list all active objects
`mat1[, 2:5]` or `mat1[, c(2, 3, 4, 5)]`: columns from 2nd to 5th
`matrix(vector1, r1, c1)`: transform `vector1` into matrix with `r1` rows and `c1` columns, columnwise
`merge(df1, df2)`: merge two data frames
`paste("cow", "boy", sep="")`: outputs `"cowboy"`
`rep(x1, n1)`: repeat vector `x1` `n1` times
`sample(x1, n1)`: sample `n1` elements from `x1` without replacement
`seq(n1, n2, n3)`: sequence from `n1` to `n2` by `n3` steps
`stack()` and `unstack()`: convert from short to long form and back again
`str(obj1)`: structure of object `obj1`
`t(mat1)`: rotate 90° matrix or data frame
`with(x1, ...)`: do something within `x1`

Cycles, conditions and functions

`for (i1 in sequence1) dosomething` : cycle
`fun1 <- function(args1) dosomething` : define function
`if (condition1) ...else ...`: single condition
`ifelse(condition1, yes, no)`: vectorized condition

Logic and math

`is.factor(obj1)`, `is.atomic(obj1)`, `is.data.frame(obj1)`: check the type of object `obj1`
`mat1[mat1 > 0]`: elements of `mat1` which are positive
`!<`, `&`, `|`, `==`: "not less", "and", "or", "equal"
`cumsum(x1)`; `diff(x1)`; `prod(x1)`; `sum(x1)`: vector math
`round(x1)`: round
`unique(x1)`: list unique elements of `x1` (could be sparse)
`*`, `^`, `sqrt(pi)`, `abs(-3)`, `log(1)`: multiplication, degree, $\sqrt{\pi}$, 3, natural logarithm
`x1 %in% x2`: which elements of `x1` are in `x2`
`which(logic1)`: indexes of all TRUE's

Descriptive statistics

`aggregate(...)`: pivot table
`apply(x1, n1, function)`: apply function to all rows (if `n1` = 1) or columns (`n1` = 2)
`colSums(mat1)`: calculate sums of every column
`rev(x1)`, `order(x1)`, `scale(x1)`, `sort(x1)`: reverse, sorting indexes, scale and center, (ascending) sort
`sapply()`; `lapply()`; `do.call()`; `replicate()`: vectorize
`summary(x1)`; `IQR(x1)`; `fivenum(x1)`; `mad(x1)`; `max(x1)`; `mean(x1)`; `median(x1)`; `min(x1)`; `sd(x1)`; `var(x1)`: descriptive statistics
`table(x1, x2)`: cross-tabulation
`tapply(x1, list1, f1)`: apply function `f1` to `x1` grouping by `list1`

Inferential statistics

`chisq.test(tab1)`: χ^2-test for table `tab1`
`cor(df1)`: (Pearson) correlations between all columns of the data frame
`cor.test(x1, x2)`: (Pearson) correlation test
`ks.test(...)`; `t.test(...)`, `wilcox.test(...)`: other tests
`lm(...)`; `glm(...)`; `aov(...)`; `anova(...)`: linear and non-linear models, analyses of variation (ANOVA)
`predict(model1)`: predict from model
`lm(y ~ x + z, data=...)`: formula interface to the additive linear model, `y` responses on two variables, `x` and `z`

Multivariate statistics

`dist(...)`: distance calculation
`cmdscale(...)`: metric multidimensional scaling (MDA)
`hclust(...)`: hierarchical cluster analysis
`princomp(...)`; `prcomp(...)`: principal component analyses (PCA)

Plots

`boxplot(...)`, `dotchart(...)`, `hist(...)`: useful plots
`identify(...)`: reveal information from points using mouse
`legend("topleft", legend="...")`: add legend to the top left corner
`lines(...)`; `points(...)`; `text(...)`: add lines, then points, then text
`pdf("file1.pdf")`: draw into `file1.pdf` until `dev.off()`
`oldpar <- par(mfrow=c(2,1))`: plots will be stacked until `par(oldpar)`
`oldpar <- par(mar=c(0,0,0,0))`: all plot margins set to zero until `par(oldpar)`
`plot(.., cex=1|2)`: normal dot size, double dot size
`plot(.., col=0|1|2|3)`: white, black, red, green color
`plot(.., lty=0|1|2)`: no lines, straight line, dashed line
`plot(.., type="p|l|s|n")`: **p**oints, **l**ines, **s**tairs and **n**o plot
`qqnorm(vec1)`; `qqline(vec1)`: check normality

`plot(.., pch=..)`: 1 ○ 2 △ 3 + 4 × 5 ◇ 6 ▽ 7 ⊠ 8 ✳ 9 ⊕ 10 ⊕ 11 ✡ 12 ⊞ 13 ⊠ 14 ◰ 15 ■
16 ● 17 ▲ 18 ◆ 19 ● 20 • 21 ○ 22 □ 23 ◇ 24 △ 25 ▽ * * . · a a ? ? 0 □