Intro to R Cheat Sheet

Basics

help(fn) or ?fn	Get help on function "fn"	
sqrt(x)	Takes the square root of x where x is a numeric.	
log(x)	Takes the natural log of x. Optional argument base=n will take the log	
c()	Combine values into a vector	
seq(from=2, to=10, by=2)	Outputs a vector from 2 to 10 by 2's. Same as c(2,4,6,8,10)	
length(x)	Returns the number of elements in x (a vector)	
ls()	Lists the current objects in the environment	
rm(x, y, z)	Removes the objects x, y, and z from the environment	
class(x)	See what kind of object "x" is	
toupper(x), tolower(x)	Converts string x to all uppercase or lowercase	
sum(x), $mean(x)$, $sd(x)$	Computes the sum, mean, or standard deviation of all the elements in x	
data()	Lists built-in datasets	
data(cars)	Loads the built-in cars dataset	
head(d), tail(d)	Prints the first or last few lines of a data.frame	
summary(d)	Summarizes a data frame (or many other kinds of objects)	
dim(d)	Returns a vector of two elements: the number of rows and the number of columns of a data.frame	
mydf\$myvar	Access the "myvar" variable in the "mydf" data.frame	
<pre>subset(d, somevar>1 & othervar<0,</pre>	Returns a subset of data.frame "d" returning only "myvar1" and "myvar2" where "somevar" is greater than 1	
with(d,)	Temporarily attach data.frame "d" and do "" with the variables attached from d. E.g.: `with(d, mean(somevar))` is the same as mean(d\$somevar).	
x[1:5]	Prints elements 1 through 5 of vector x	
d[2:4, c(3,5,7)]	Prints the 2nd through 4th row and 3rd, 5th, and 7th column of data.frame "d"	
d[, 1:3]	Prints all rows and the first three columns of data.frame "d"	
d[c(1:3,5),]	Prints rows 1, 2, 3, and 5, and all columns of data.frame "d"	
hist(x, breaks=10, col="black")	Plots a histogram of variable "x" with 10 bins colored black	
<pre>with(df, plot(x, y))</pre>	Scatterplot of y versus x	
read.table("data.txt",header=TRUE)	Reads "data.txt" from the current working directory, assuming that the file has a header row of variable names	
<pre>write.table(df, file="output.txt")</pre>	Writes data.frame "df" to "output.txt" in the working directory	
read.csv(), write.csv()	Reads and writes CSV files	
sessionInfo()	Prints information about R session and versions of all attached packages	

DESeq2

library(DESeq2)	Load the DESeq2 library (each time you use it; must install once, see below)	
vignette("DESeq2")	Open the DESeq2 vignette (tutorial with data and examples).	
<pre>dds <- DESeqDataSetFromMatrix()</pre>	Creates a DESeqDataSet object called "dds" from three objects: a count matrix, column data, and a design formula. See the DESeq2 vignette for more information.	
dds <- DESeq(dds)	Runs the DESeq pipeline on a DESeqDataSet object named "dds" — estimates normalization size factors, estimates dispersion, and fits a negative binomial model. Reassigns the result to the same "dds" object.	
res(dds)	Get differential expression results out of a DESeqDataSet object that has been run through the DESeq() pipeline. Returns a data.frame.	
plotMA(dds)	Plots a MA-plot of an analyzed DESeqDataSet	
rld <- rlogTransformation(dds)	Apply a regularized log transformation of a DESeqDataSet to create a dataset useful for clustering or heatmaps.	
assay(rld)	Gets the regularized log data out of a transformed dataset.	
hclust(dist(t(assay(rld))))	Runs hierarchical clustering (hclust) on the distance matrix (dist) of the transposed (t) expression data (assay) from a regularized log-transformed DESeqDataSet	

Installing Packages

Packages only need to be installed once, but must be loaded (with library) every session.

named "rld"

From CRAN (http://cran.r-project.org/web/packages/):
install.packages("mypackage")

From Bioconductor (http://www.bioconductor.org/):
source("http://bioconductor.org/biocLite.R")
biocLite("mypackage")
biocLite("myotherpackage")

<u>Load an installed package:</u> library(mypackage)

RStudio

Options / Pane layout: In the course my setup look like this (source top left, console top right, environment bottom left, files bottom right):
 Session → Set Working Directory → Choose...

Source	Console
Environment/history	Files/plots/help

- Always write commands and save them in a script file (file, new file, R Script). Save this script, and send commands from the editor (source) to the console with Ctrl-Enter (PC) or \(\mathbb{H}-Enter (Mac). \)
- If your console prompt starts with a + instead of a >, you likely forgot to close a quote or parenthesis. Focus on the console pane and hit the Escape key.