Built-in Functions

builtins()	# List all built-in functions
ls()	# list the objects in the workspace
rm()	#delete stored objects

Getting Help

help(options)	# list of available options
help() ?function name	#documentation of topic
help.start()	# help about argument#start HTML version of help
help.search()	#help about built in function#search the help system
apropos()	#names of all objects in the search list matching the expression
example()	#example of function
demo()	#demo of function
help(package=stats)	# List all stats functions
help(package=graphics)	# List all graphics functions
?Chisquare	# Help on chi-squared distribution functions
?Poisson	# Help on Poisson distribution functions

Input/output commands

c(x)	# A generic function which combines its arguments
print()	# print the results
scan()	# to input data on runtime
cat(x)	# Prints the arguments
which(x==a)	#returns the vector of indices satisfying the given condition
which.max()	#returns the index of the greatest element of x
which.min()	#returns the index of the smallest element of x

```
as.numeric()    #variable conversion


is.object()       #check the type of the object as specified

as.object()       #take the object as specified type

history()                        # display last 25 commands

savehistory(file="myfile")        # default is ".Rhistory"# save your command history to a file

loadhistory(file="myfile")       # default is ".Rhistory" # recall your command history

load("myfile.RData")             # load a saved workspace into the current session

q()                              # quit R

q(save="no")                     # to avoid having R asking you whether it should save your data

library(MASS)             # load the package "MASS"

install.packages()        #istallation through command

?NA      # Help page on handling of missing data values

System.time()    # Return system time

Proc.time()      #Return current time

Sys.Date()    # Return system date

getwd()      # Return working directory

set.seed()        #generate same random numbers each time
```

Built-in constants:

```
pi,letters,LETTERS   # Pi, lower & uppercase letters, e.g. letters[7] = "g"

month.abb,month.name # Abbreviated & full names for months
```

Operators

```
+,-,*,/,^,%%,%/%        #Arithmetic operators

%*%                     #matrix multiplication

<,>,<=,>=,==,!=         #Comparison operators
```

```
|, &, !                         #logical operators
```

General Mathematics functions

```
log(x),logb(),log10(),log2(),exp(),expm1(),log1p(),sqrt() #Fairly obvious

cos(),sin(),tan(),acos(),asin(),atan(),atan2() #Usual stuff

cosh(),sinh(),tanh()                #Hyperbolic functions

acosh(),asinh(),atanh()             #inverse Hyperbolic functions

union(),intersect(),setdiff(),setequal() #Set operations
```

Statisctical Functions

```
sd()            # Calculate standard deviation

summary(x)          # Returns a summary of x: mean, min, max etc.

var()            # Calculate variance

cumsum(); cumprod(); cummin(); cummax()   # Cumuluative functions for vectors

mean(x), weighted.mean(x), median(x), min(x), max(x), quantile(x)

Assign()                            #assign value to an object

abs(x)              # The absolute value of "x"

append()            # Add elements to a vector

rbind(),cbind()    # Combine vectors by row/column (cf. "paste" in Unix)

diff(x)             # Returns suitably lagged and iterated differences

identical()         # Test if 2 objects are *exactly* equal

length(x)           # Return no. of elements in vector x

dim()               #find the size/dimension of matrix

mat.or.vec()        # Create a matrix or vector

range(x)     # Returns the minimum and maximum of x

rep(1,5)     # Repeat the number 1 five times

rev(x)      # List the elements of "x" in reverse order

seq(1,10,0.4)  # Generate a sequence (1 -> 10, spaced by 0.4)
```

sign(x)   # Returns the signs of the elements of x

sort(x)   # Sort the vector x

order(x)   # list sorted element numbers of x

tolower(),toupper() # Convert string to lower/upper case letters

unique(x)   # Remove duplicate entries from vector

vector()   # Produces a vector of given length and mode

floor(x), ceiling(x), round(x), signif(x), trunc(x)   # rounding functions

eigen()   # Computes eigenvalues and eigenvectors

deriv()   # Symbolic and algorithmic derivatives of simple expressions

integrate() # Adaptive quadrature over a finite or infinite interval.

sqrt(),sum()

mad()   # Calculate median absolute deviation

t()   #transpose of the matrix

det()   #determinant of square matrix

solve()   #inverse of non singular matrix

names(),colnames(),rownames() #naming objects

data.frame()   #create a data frame of two or more vectors

edit()   #to edit any data file

transform()   #transform data in new variable

read.table() , read.csv() , read.sav() #to input data from particular source

write.table() , write.csv() , write.sav() #to save data at particular source/format

subset()   #select a subset of whole data

list()   #list of vectors,matrix or complex vectors

Plotting

boxplot()   #box and whisker plot

stem()   #stem and leaf display

```
barplot()           #bar diagram

plot()              # Generic function for plotting of R objects

par()               # Set or query graphical parameters

curve(5*x^3,add=T)    # Plot an equation as a curve

points(x,y)           # Add another set of points to an existing graph

arrows()              # Draw arrows [see errorbar script]

abline()             # Adds a straight line to an existing graph

lines()             # Join specified points with line segments

hist(x)             # Plot a histogram of x

pairs()             # Plot matrix of scatter plots

matplot()             # Plot columns of matrices

legend()             #keynote on the graph

dev.off()            #turn the graphical device off

?device              # Help page on available graphical devices

postscript()          # Plot to postscript file

attach()             #attach a data file

detach()             #detach the file

pdf()               # Plot to pdf file

png()               # Plot to PNG file

jpeg()              # Plot to JPEG file

image()              # Plot an image
```

Model fitting

```
lm                  # Fit liner model

glm                 # Fit generalised linear model

nls                 # non-linear (weighted) least-squares fitting
```

Distributions

rnorm(), runif() , rchisq() # Generate random data with Gaussian/uniform distribution /chi square

rexp(), rgamma(), rpois() , rweibull(), rcauchy(), rbeta(), rt(), rf(),

rgeom(), rhyper(), rbinom(), rlnnorm(), rwilcox()

dnorm(x) # normal density function (by default m=0 sd=1)

plot(x, y, type='l', xlab="Normal Deviate", ylab="Density", yaxs="i") # plot standard normal curve

pnorm(q) # cumulative normal probability for q (area under the normal curve to the right of q)

qnorm(p) # normal quantile. value at the p percentile of normal distribution

rnorm(n, m=0,sd=1) # n random normal deviates with mean m

and standard deviation sd.

qt(),qnorm(),qchisq(),qwilcox() #table value of t, normal or chisquare dist, wilcoxon table

sample() # Random samples & permutations

ecdf() # Empirical Cumulative Distribution Function

Statistics

qqplot() # quantile-quantile plot

cor.test() # Perform correlation test

anova() #compute ANOVA table for fitted model objects

aov() #fit an analysis of variance by a call to lm for each stratum

t.test() # Student's t-test

ks.test() # Performs one or two sample Kolmogorov-Smirnov tests

shapiro.test() #Test for normality

Programming

Function() #write user defined function

Ifelse(condition,yes,no) #test a condition n perform action depending on condition

If(condition)expression

For(var in seq) expression

Advanced data processing

paste(..., sep="")	**# Concatenate strings after using sep string to seperate them.**
Apply()	#function is applied to all columns/rows of a matrix
lapply(), sapply()	#function is applied to all objects of a list