BASE R CHEAT SHEET

INTRODUCTION TO R

1 R/Rstudio Installation

Open source tool for Statistical Computing and Graphics

Free IDE for R

2 Creating a Vector

c(1,3,5)	1 3 5	Joint elements into a vector
2:5	2 3 4 5	An integer sequence
seq(1,2,by=0.5)	1.0 1.5 2.0	Complex Sequence
rep(1:2,times=2)	1 2 1 2	Repeat a Vector
rep(1:2,each=2)	1 1 2 2	Repeat elements for a vector

3 Class and Class Conversion

class()	"numeric"	Returns type of a vector
as.integer()	1,2,3	convert a vector to class integer
as.character()	"Jigsaw"	convert a vector to class character
as.factor()	"Gender" levels: "Male" "Female"	convert a vector to class factor
as.numeric()	1.1,2.1,3.1	convert a vector to class numeric
as.logical()	1,0,TRUE,FALSE	convert 1/0 as boolean vector

4 Arithmetic Operations

a+b	Sum of two vectors
a-b	Subtraction of two vectors
a*b	Multiplication of two vectors
a**2/a^2	Exponentiation of a vector
a/2	Division of a vector
a%%2	Reminder of a vector

5 Strings

```
> course<-"Data science with R"
> class(course)
[1] "character"
```

6 Data Frame

data.frame()	A list of variables with same length

```
> df=data.frame(x=1:4,y=c('a','b','c','d'))
> df
  x y
1 1 a
2 2 b
3 3 c
4 4 d
> dim(df)
[1] 4 2
```

The data frame has 4 rows and 2 columns

7 Matrices and Arrays

matrix()	A two-way generalization of a vector, one representing a row and the second representing a column
array()	An array in R can have one, two or more dimensions. Most of the times the elements of an array are matrices

```
> x<-1:9
> m <- matrix(x, nrow = 3, ncol = 3)
> m
     [,1] [,2] [,3]
[1,]    1    4    7
[2,]    2    5    8
[3,]    3    6    9
> class(iris3)
[1] "array"
> dim(iris3)
[1] 50  4  3
```

INTRODUCTION TO R

7 Lists

list() – Includes elements of any class and dimension.

```
> n<-1:5
> class(n)
[1] "integer"
> chr<-c(1,2,3,'a','b','c')
> class(chr)
[1] "character"
> class(iris)
[1] "data.frame"
> class(iris3)
[1] "array"
> list=list(n,chr,iris,iris3)
> class(list)
[1] "list"
```

9 Index: By Position

In R index starts at 1

n[1]	Extract first element from vector
iris[1]	Extract first column from data frame
iris[,1:2]	Extract first two columns
iris[1:3,]	Extract first three rows and all the columns
iris[2,3]	Select the element in 2nd row and 3rd column
iris3[,,1]	Extract first element from an array
list[1]	Returns a list of selected elements
list[[1]]	To select any single element of any class
iris$Species	Extract a column by column name
list$n	To extract the element with label 'n'
list[["n"]]	[[allows character indices

10 Index: By Value

int=rep(1:2,each=2) int[int==2]	Elements which are equal to 2
int[int<2]	All elements less than 2
int[int %in% c(0,1,2,3)]	Elements in the set 0,1,2,3
int[int!=1]	Elements not equal to 1

11 More about an object

str()	Get a summary of an object's structure

```
> str(iris)
'data.frame':   150 obs. of  5 variables:
 $ Sepal.Length: num  5.1 4.9 4.7 4.6 5 5.4 4.6 5 4.4 4.9 ...
 $ Sepal.Width : num  3.5 3 3.2 3.1 3.6 3.9 3.4 3.4 2.9 3.1 ...
 $ Petal.Length: num  1.4 1.4 1.3 1.5 1.4 1.7 1.4 1.5 1.4 1.5 ...
 $ Petal.Width : num  0.2 0.2 0.2 0.2 0.2 0.4 0.3 0.2 0.2 0.1 ...
 $ Species     : Factor w/ 3 levels "setosa","versicolor",..: 1 1 1 1 1 1 1 1 1 1 ...
```

12 Using Packages

install.packages("lubridate")	Download and install a package from CRAN
library(lubridate)	Load the package into the session, making all its functions and data available to use
dplyr::filter	Use a particular function from a package
lakers	Load a built-in dataset from 'lubridate' package into the environment

13 Working Directory

getwd()	Returns current working directory where inputs are found and outptus are sent
setwd("C://Path")	Change the current working directory to the desired path

INTRODUCTION TO R

14 Data Import and Export

read.csv("file.csv")	To import csv files into R, returns a data frame
read.table("file.txt")	To import files of type csv,tab separated, tsv etc into R, returns a data frame
loadWorkbook("data.xlsx")	To import excel workbooks into R, requires XLConnect library to be installed
readWorksheet()	Reads data from worksheets of a workbook, requires XLConnect library
load("file.Rdata")	Read an R data file
readHTMLTable()	To scrap data from html files, requires XML library to be installed
write.csv()	Write data frames or matrices in a csv format
save(df, file = "file.Rdata")	Write an R data file

15 The Environment

ls()	List all variables in the environment
rm(x)	Remove x from the environment
rm(list=ls())	Remove all the variables from the environment
Note: Use the environment panel in Rstudio to browse variables in your environmnet	

16 Getting Help

?mean	Get help of a particular function
help.search('weighted mean')	Search the help files for a word
help(package='dplyr')	Find help for a package

10 Maths Functions

log(x)	Natural log
exp(x)	Exponential
round(x,n)	Round to n decimal places
quantile(x)	Percentage quantiles
cor()	Correlation
rank(x)	Rank of elements
median(x)	Median
sqrt(x)	Square root

11 More about Data Structures

Dimension	Homogeneous	Heterogeneous
1d	Atomic vector	List
2d	Matrix	Data Frame
nd	Array	

Note: R has no 0-dimensional or scalar types. Individual numbers or strings, are actually vectors of length one, NOT scalars.

12 Logic in R - ?Comparison, ?base::Logic

<	Less than	!=	Not equal to
>	Greater than	%in%	Group membership
==	Equal to	is.na	Is NA
<=	Less than or equal to	!is.na	Is not NA
>=	Greater than or equal to	&,|,!,xor,any,all	Boolean operators