Summary 1, R
Chapter 1: Introduction

- Install and load packages:

install.packages('BayesTree')
library(BayesTree)

- Use scripts

- Use R help

Remark:working directory = default location to store files + to look for files
getwd()
setwd()

Chapter 2: Different data structures

vector
factor
matrix
data frame
list

a. Vectors

Generating vectors:
X <- c(1,2,8)
X <- 1:8
X <- seq(from=-2, to=5, by =0.5)
X <- rep(2:5,2)

Taking subset of a vector:
X[X>2]
X[-5]

Giving names to the values of the vector:
X <- 1:8
names(X) <- paste("no",1:8)

b. Factors

Generating factor:
factor(), as.factor()

c. Matrices

Generating matrix:
rbind, cbind, matrix

Taking subset of a matrix:
mat[rows , column]

Giving names to the rows and columns of the matrix:
dimnames(mat) <- list(paste("row", 1:2), paste("col",LETTERS[1:4]))

d. Dataframe

Generating dataframe:

cbind
rbind
merge
data.frame

Taking subset of a dataframe:
Temp <- airquality$Temp

air <- airquality[rows,colms]

Sorting a dataframe by one of its variables
```
sort_air10 <- orderBy(~Temp, data=air10)
```

remark:
names(airquality)
head(airquality)

e. List

 y <- list(numbers = x1, second = x2)

y$numbers
y[1]

Chapter 3: Reading data from external files

import Excel file and create R data frame

```
install.packages("readxl")
library(readxl)
```

Import the *Excel* file *titanic.xlsx* with the function `read_excel`.

```
titanic2 <- read_excel("C:/Users/.../titanic.xlsx") # Note that '/' needs to be used (not '\')
```

Remark:
In case Excel file is available in working directory:

titanic2 <- read_excel("titanic.xlsx")

export data frame to Excel file

```
install.packages("openxlsx")
library(openxlsx)
write.xlsx(airquality, file = "AirData.xlsx")
```

Chapter 4: Writing your own functions

```r
# Use of the list function in your Pythagoras function
Pythagoras <- function(a,b)
{
  c <- sqrt(a^2 + b^2)
  list(a=a, b=b, hypothenusa=c)
}

# Apply your function
Pythagoras(a=1,b=1)
```

```
## $a
## [1] 1
##
## $b
## [1] 1
##
## $hypothenusa
## [1] 1.414214
```

The last command executed is the return value of the function.

Remark:

```
> # use of default values for the parameters
> Pythagoras <- function(a=1,b=4)
+ {
+    c <- sqrt(a^2 + b^2)
+    list(a=a, b=b, hypothenusa=c)
+ }
> # Apply your function
> Pythagoras()
$a
[1] 1

$b
[1] 4

$hypothenusa
[1] 4.123106
```