SRT411 Assignment 0

Christopher Belsanti

February 14, 2019

Github Username

cbelsanti

Introduction

This is teh SRT411 Assigment 0. In this assigment I had to write and run R code that makes the Todo's from the document given for this lab.

Document Link

https://cran.r-project.org/doc/contrib/Torfs+Brauer-Short-R-Intro.pdf

Todo codes and answers

ToDo 1

Compute the difference between 2014 and theyear you started at this university and dividethis by the difference between 2014 and the yearyou were born. Multiply this with 100 to getthe percentage of your life you have spent atthis university. Use brackets if you need them.

```
((2018 - 2014) / (2014-1999)) * 100
```

```
## [1] 26.66667
```

ToDo 2

Repeat the previous ToDo, but with severalsteps in between. You can give the variablesany name you want, but the name has to startwith a letter.

```
a = 2018 - 2014
b = 2014-1999
c = a/b
d = c*100
d
```

```
## [1] 26.66667
```

ToDo 3

Compute the sum of 4, 5, 8 and 11 by first com-bining them into a vector and then using thefunction sum.

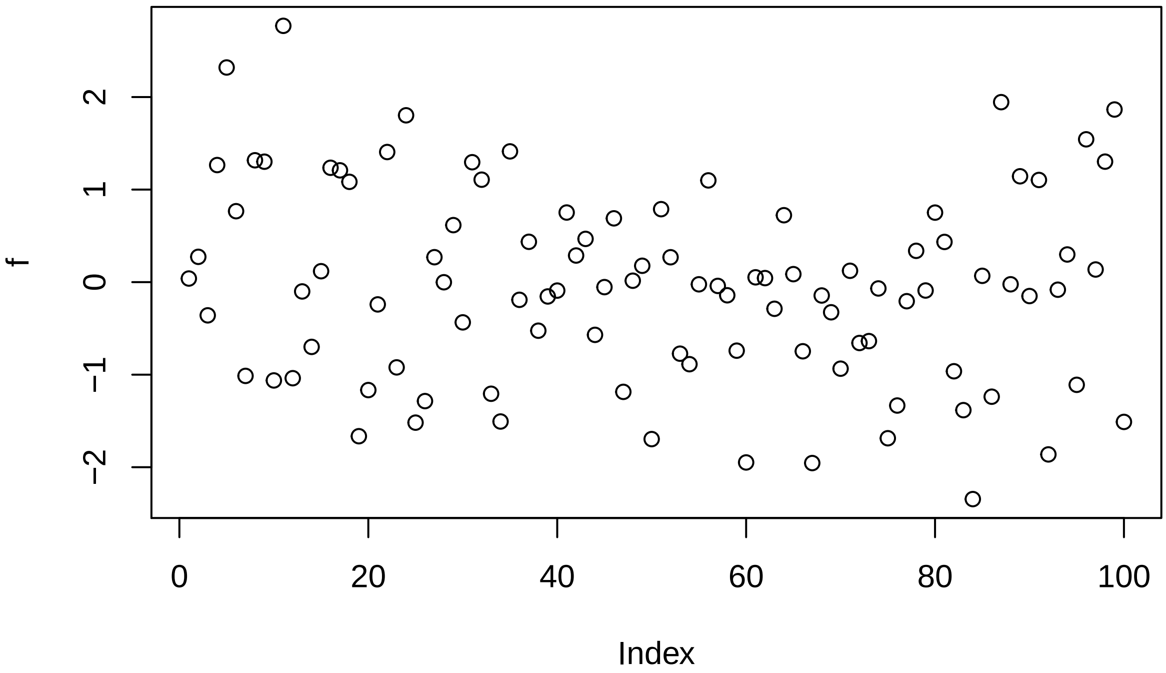
```
e=c(4,5,8,11)
sum(e)
```

```
## [1] 28
```

ToDo 4

Plot 100 normal random numbers.

```
f = rnorm(100)
plot(f)
```



ToDo 5

Find help for the sqrt function.

```
help(sqrt)
```

MathFun {base} R Documentation Miscellaneous Mathematical Functions

Description

abs(x) computes the absolute value of x, sqrt(x) computes the (principal) square root of x, √{x}.

The naming follows the standard for computer languages such as C or Fortran.

Usage

abs(x) sqrt(x) Arguments

x
a numeric or complex vector or array. Details

These are internal generic primitive functions: methods can be defined for them individually or via the Math group generic. For complex arguments (and the default method), z, abs(z) == Mod(z) and sqrt(z) == z^0.5.

abs(x) returns an integer vector when x is integer or logical.

S4 methods

Both are S4 generic and members of the Math group generic.

References

Becker, R. A., Chambers, J. M. and Wilks, A. R. (1988) The New S Language. Wadsworth & Brooks/Cole.

See Also

Arithmetic for simple, log for logarithmic, sin for trigonometric, and Special for special mathematical functions.

‘plotmath’ for the use of sqrt in plot annotation.

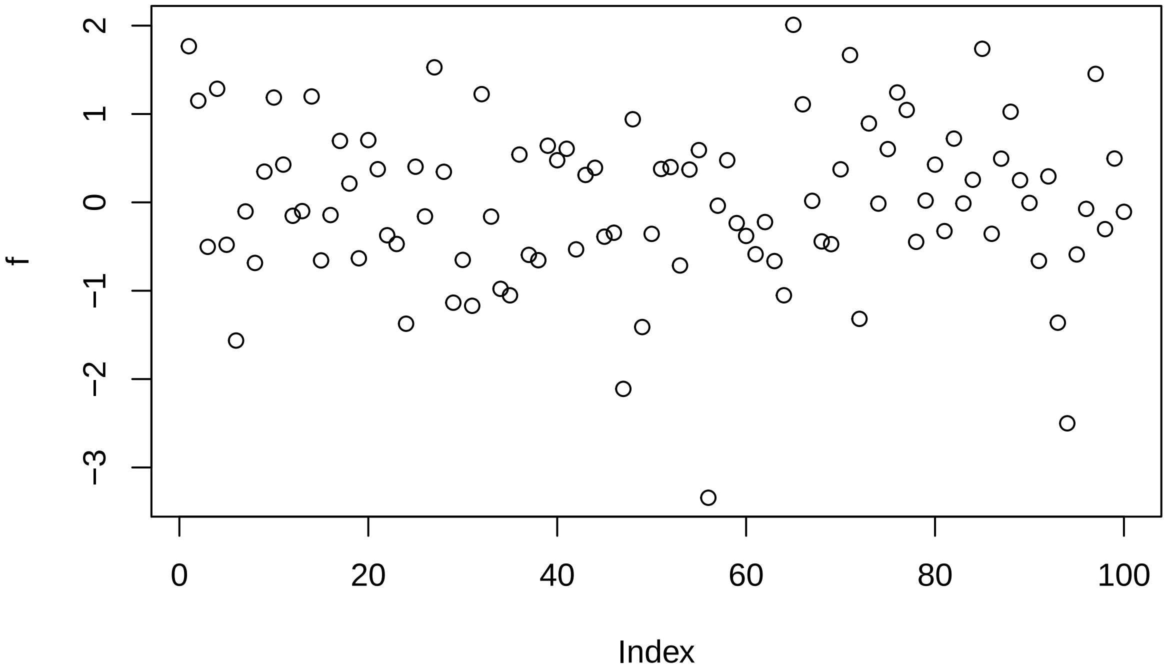
Examples

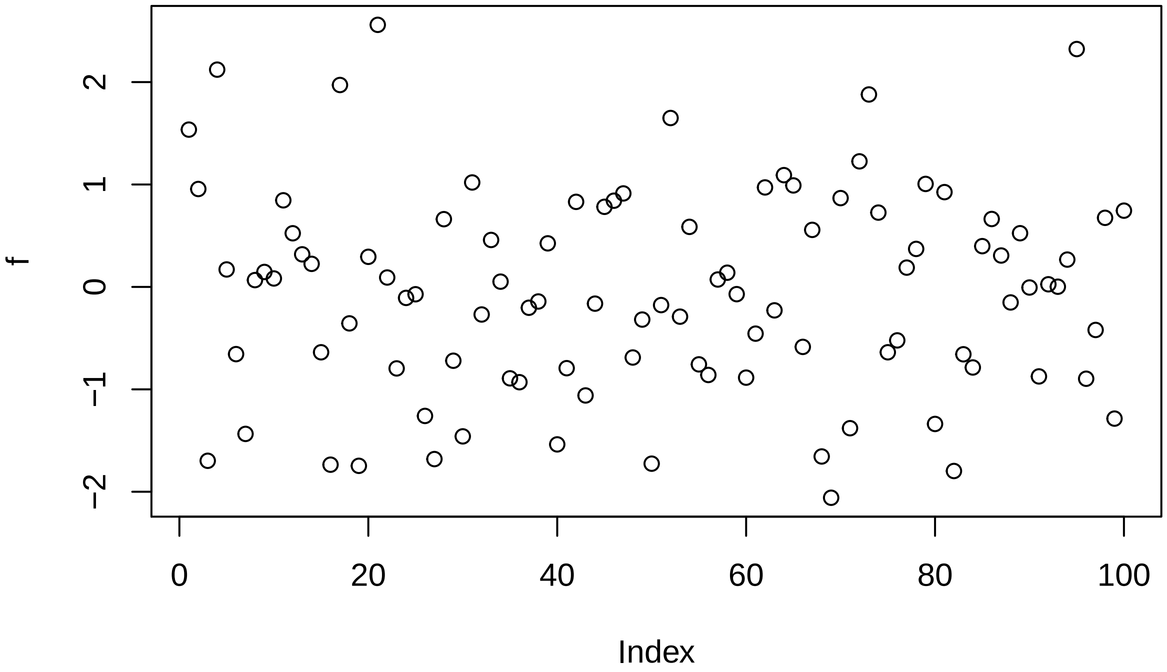
require(stats) # for spline require(graphics) xx <- -9:9 plot(xx, sqrt(abs(xx)), col = “red”) lines(spline(xx, sqrt(abs(xx)), n=101), col = “pink”)

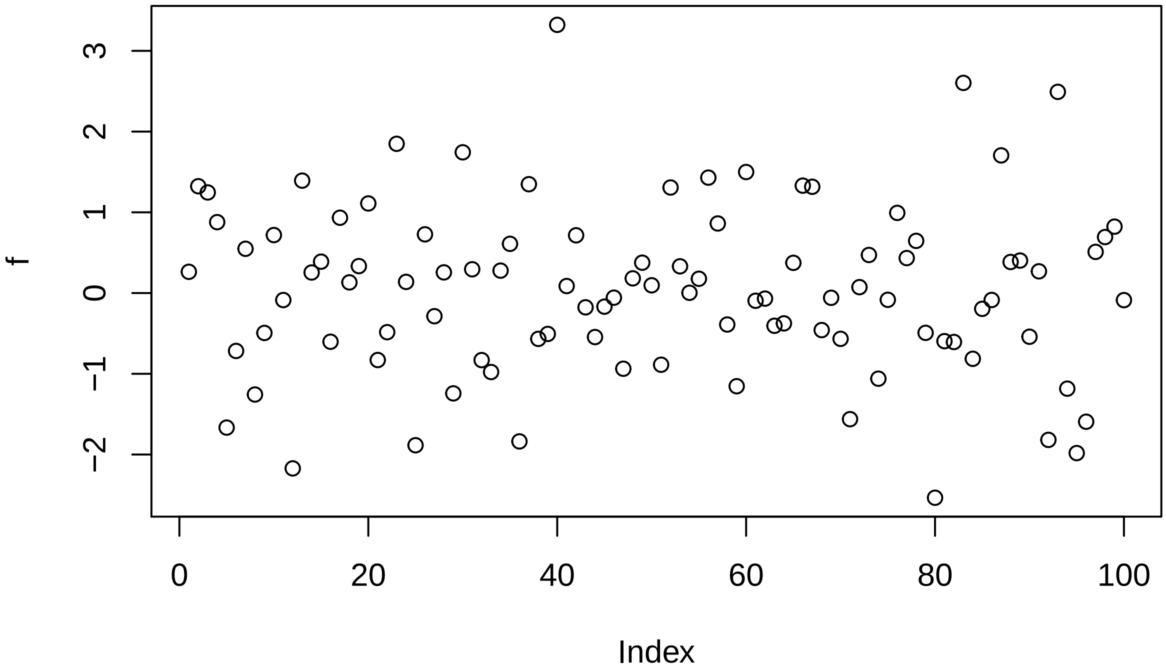
ToDo 6

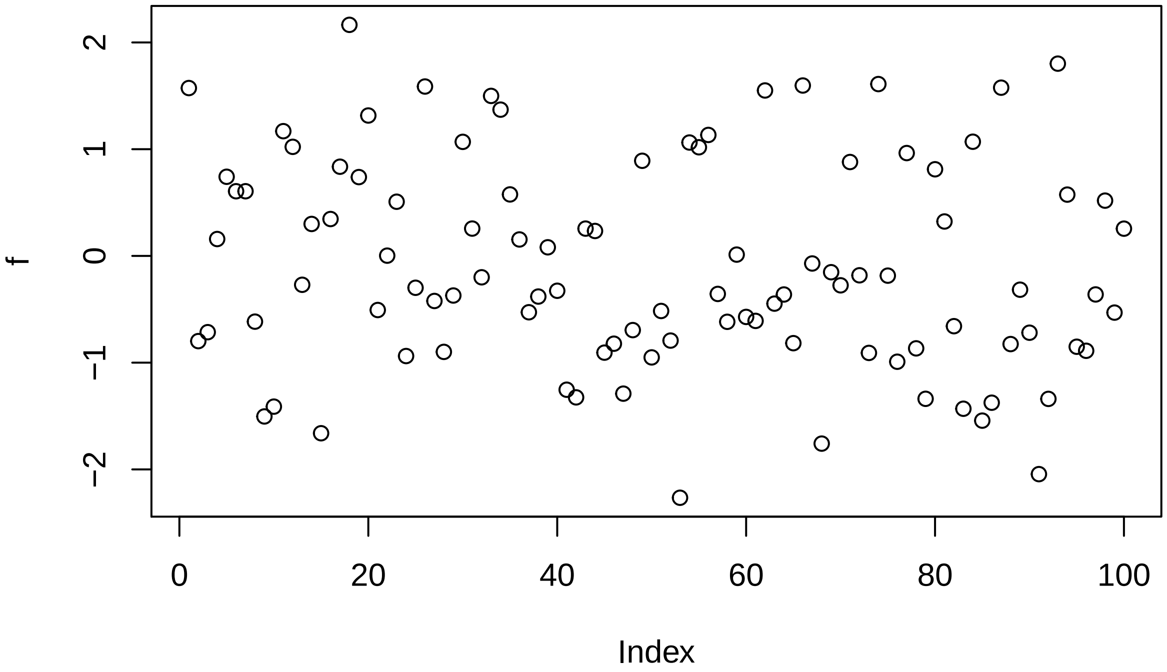
Make a file called firstscript.R containing R-code that generates 100 random numbers andplots them, and run this script several times.

```r
source("~/R/firstscript.R")
```


f
2
1
0
−1
−2
−3
0
20
40
60
80
100
Index


f
2
1
0
−1
−2
0
20
40
60
80
100
Index


f
3
2
1
0
−1
−2
0
20
40
60
80
100
Index



ToDo 7

Put the numbers 31 to 60 in a vector named Pand in a matrix with 6 rows and 5 columns named Q. Tip: use the function seq. Look atthe different ways scalars, vectors and matrices are denoted in the workspace window.

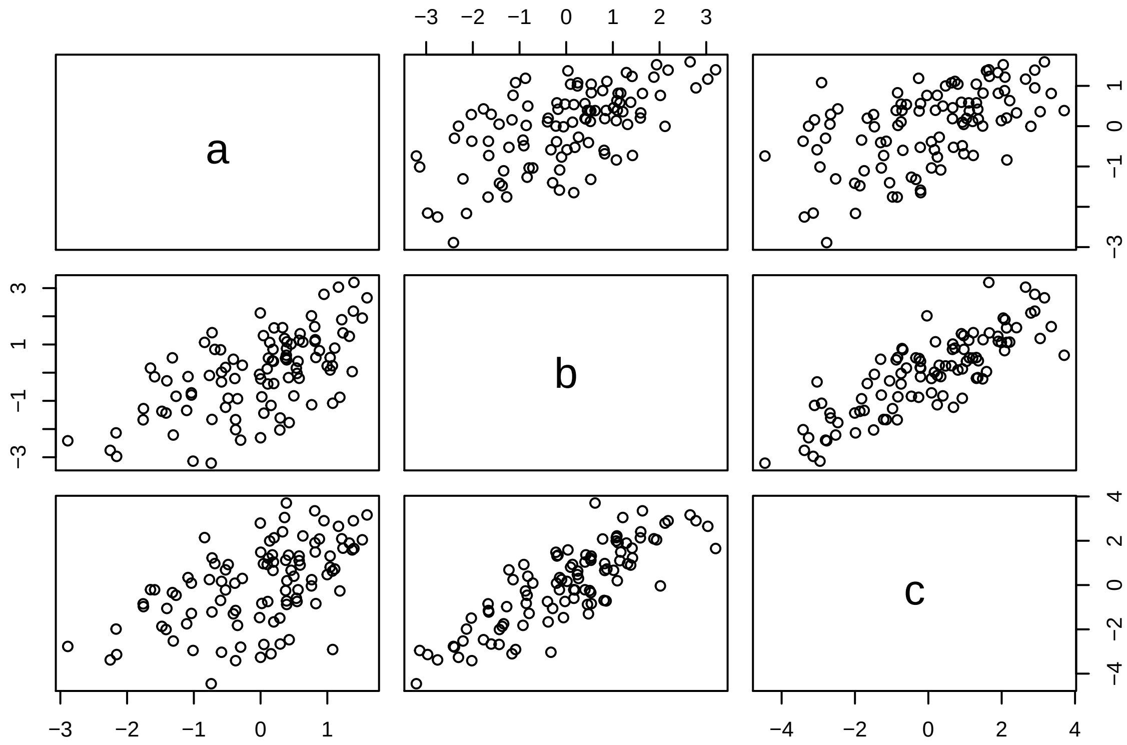
```
P=seq(from=31, to=60, by=1)
Q = matrix(P, ncol=5, nrow=6)
Q
```

```
##      [,1] [,2] [,3] [,4] [,5]
## [1,]   31   37   43   49   55
## [2,]   32   38   44   50   56
## [3,]   33   39   45   51   57
## [4,]   34   40   46   52   58
## [5,]   35   41   47   53   59
## [6,]   36   42   48   54   60
```

ToDo 8

Make a script file which constructs three ran-dom normal vectors of length 100. Call thesevectorsx1,x2andx3. Make a data frame called t with three columns (calleda,bandc) con-taining respectively x1,x1+x2 and x1+x2+x3.Call the following functions for this data frame: plot(t) and sd(t).

```
source("~/R/todo8.R")
```

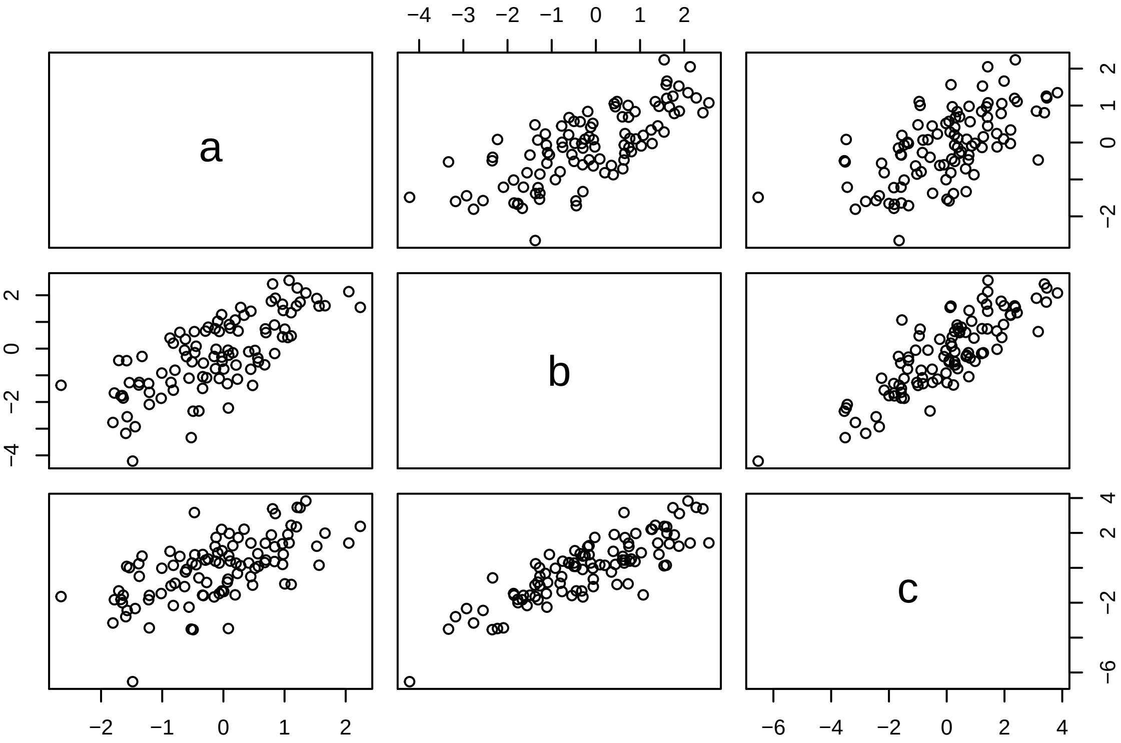


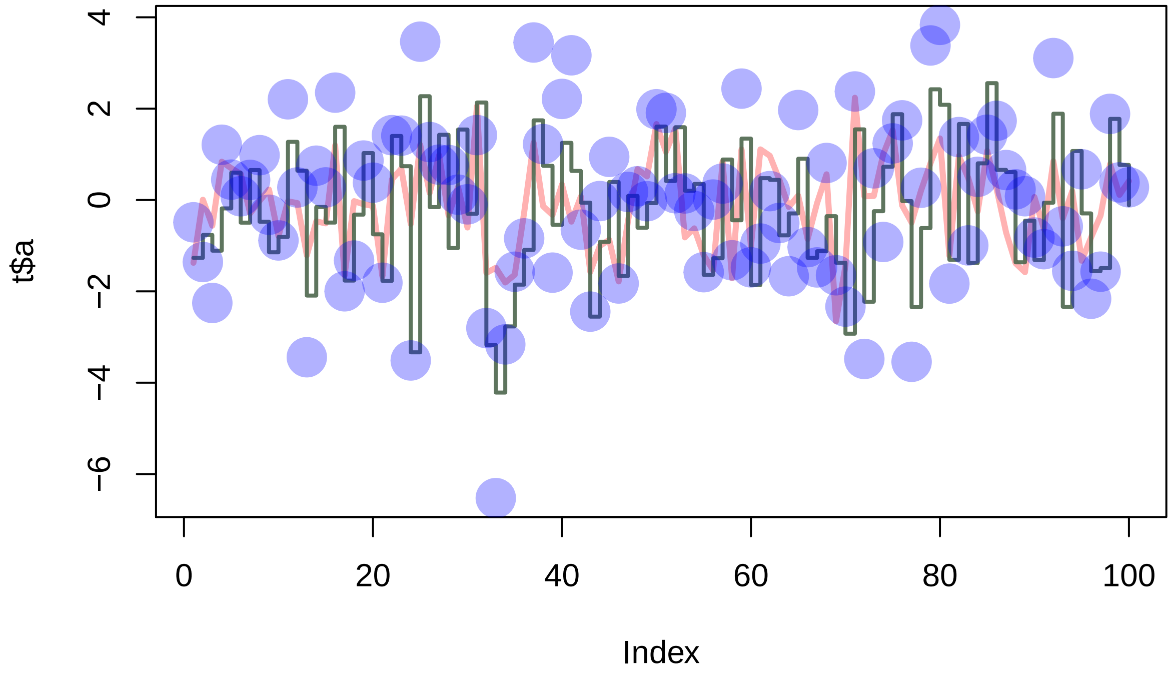
8-1.bb

ToDo 9

Add these lines to the script file of the previous section. Try to find out, either by experiment-ing or by using the help, what the meaning is of rgb, the last argument of rgb,lwd,pch,cex.

```
source("~/R/todo9.R")
```


a
b
c
−4
−3
−2
−1
0
1
2
−2
0
1
2
−4
−2
0
2
−6
−2
2
4
−2
−1
0
1
2
−6
−4
−2
0
2
4



ToDo 10

Make a file called tst1.txt in Notepad from the example in Figure 4 and store it in your working directory. Write a script to read it, tomultiply the column calle dg by 5 and to store it as tst2.txt.

```
w = read.table(file="/home/cbelsanti/R/tst1.txt", header=TRUE)
w2 = w[2] * 5
w3 = data.frame(w[1], w2, w[3])
write.table(w3, file="tst2.txt", row.names=FALSE)
w3
```

```
##    a   g  x
## 1  1  10  3
## 2  2  20  6
## 3  4  40 12
## 4  8  80 24
## 5 16 160 48
## 6 32 320 96
```

ToDo 11

Make a file called tst1.txt in Notepad from the example in Figure 4 and store it in your working directory. Write a script to read it, tomultiply the column calle dg by 5 and to store it as tst2.txt.

```
r= c(rnorm(100))
mean(sqrt(r))
```

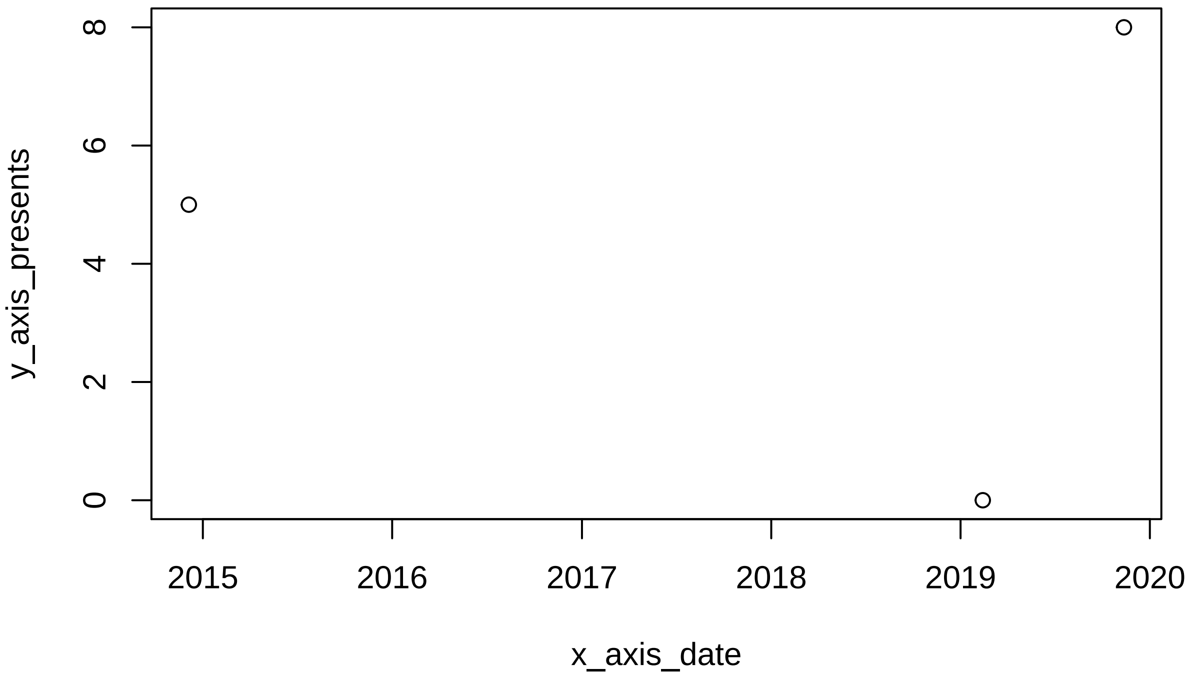
```
## Warning in sqrt(r): NaNs produced
```

```
## [1] NaN
```

ToDo 12

Compute the mean of the square root of a vec-tor of 100 random numbers.

```
x_axis_date=strptime( c("20190212204100", "20141205000000", "20191112010000"), format="%Y%m%d%H%M%S")
y_axis_presents = c(0,5,8)
plot(x_axis_date,y_axis_presents)
```



ToDo 13

Make a graph with on the x-axis: today, Sin-terklaas 2014 and your next birthday and onthe y-axis the number of presents you expect oneach of these days

```
g=seq(from=1, to=100, by=1)
for(i in g)
{
if(g[i] < 5)
{
g[i] = g[i] * 10
} else if(g[i] > 90)
{
g[i] = g[i] * 10
} else {
g[i] = g[i] * 0.1
}
}
g
```

```
##   [1]   10.0   20.0   30.0   40.0    0.5    0.6    0.7    0.8    0.9    1.0
##  [11]    1.1    1.2    1.3    1.4    1.5    1.6    1.7    1.8    1.9    2.0
##  [21]    2.1    2.2    2.3    2.4    2.5    2.6    2.7    2.8    2.9    3.0
##  [31]    3.1    3.2    3.3    3.4    3.5    3.6    3.7    3.8    3.9    4.0
##  [41]    4.1    4.2    4.3    4.4    4.5    4.6    4.7    4.8    4.9    5.0
##  [51]    5.1    5.2    5.3    5.4    5.5    5.6    5.7    5.8    5.9    6.0
##  [61]    6.1    6.2    6.3    6.4    6.5    6.6    6.7    6.8    6.9    7.0
##  [71]    7.1    7.2    7.3    7.4    7.5    7.6    7.7    7.8    7.9    8.0
##  [81]    8.1    8.2    8.3    8.4    8.5    8.6    8.7    8.8    8.9    9.0
##  [91]  910.0  920.0  930.0  940.0  950.0  960.0  970.0  980.0  990.0 1000.0
```

ToDo 14

Make a vector from 1 to 100. Make a for-loopwhich runs through the whole vector. Multiply the elements which are smaller than 5 and largerthan 90 with 10 and the other elements with 0.1.

```
g=seq(from=1, to=100, by=1)
fun1 = function(var)
{
length(var)
for(i in var)
{
if(var[i] < 5)
{
var[i] = var[i] * 10
} else if(var[i] > 90)
{
var[i] = var[i] * 10
} else {
var[i] = var[i] * 0.1
}
}
return(var)
}
fun1(g)
```

```
##   [1]   10.0   20.0   30.0   40.0    0.5    0.6    0.7    0.8    0.9    1.0
## [11]    1.1    1.2    1.3    1.4    1.5    1.6    1.7    1.8    1.9    2.0
## [21]    2.1    2.2    2.3    2.4    2.5    2.6    2.7    2.8    2.9    3.0
## [31]    3.1    3.2    3.3    3.4    3.5    3.6    3.7    3.8    3.9    4.0
## [41]    4.1    4.2    4.3    4.4    4.5    4.6    4.7    4.8    4.9    5.0
## [51]    5.1    5.2    5.3    5.4    5.5    5.6    5.7    5.8    5.9    6.0
## [61]    6.1    6.2    6.3    6.4    6.5    6.6    6.7    6.8    6.9    7.0
## [71]    7.1    7.2    7.3    7.4    7.5    7.6    7.7    7.8    7.9    8.0
## [81]    8.1    8.2    8.3    8.4    8.5    8.6    8.7    8.8    8.9    9.0
## [91]  910.0  920.0  930.0  940.0  950.0  960.0  970.0  980.0  990.0 1000.0
```

```
length(g)
```

```
## [1] 100
```

Soruces used to complete the assigment

- https://cran.r-project.org/doc/contrib/Torfs+Brauer-Short-R-Intro.pdf
- https://stackoverflow.com/questions/26994958/error-cannot-open-the-connection-in-executing-knit-html-in-rstudio
- https://www.rstudio.com/wp-content/uploads/2015/02/rmarkdown-cheatsheet.pdf
- http://kbroman.org/knitr_knutshell/pages/Rmarkdown.html
- http://kbroman.org/knitr_knutshell/pages/markdown.html
- https://nicercode.github.io/guides/reports/
- https://rmarkdown.rstudio.com/