A (very) short introduction to R

kaylavie

In this document you'll find a short introduction to the R programming language as described in https://cran.r-project.org/doc/contrib/Torfs+Brauer-Short-R-Intro.pdf. The code and its output were generated with Rstudio, "R markdown"" and "knitr".

1. ToDo 3.1

```
abs((2016-2014)/(2014-1901)*100)
```

```
## [1] 1.769912
```

2. ToDo 3.2

```
yob = 1901
start = 2016
life = 2014 - yob
school = 2014 - 2016
abs(school/life) * 100
```

```
## [1] 1.769912
```

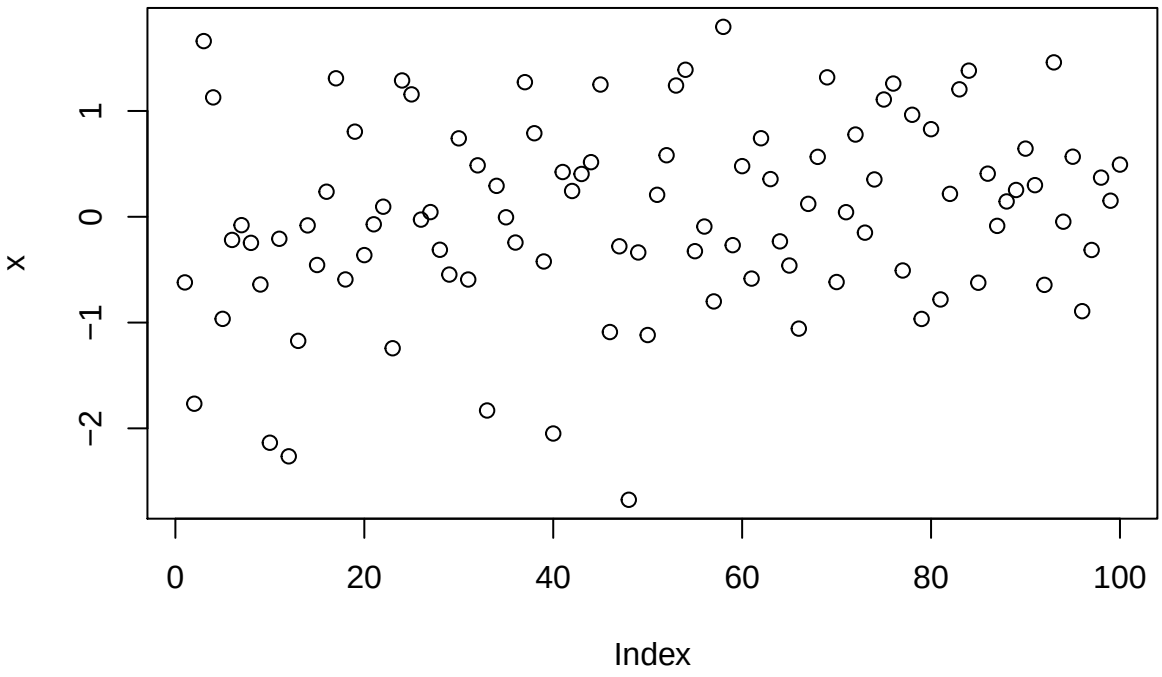
3. ToDo 3.3

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

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

4. ToDo 3.4

```
x=rnorm(100)
plot(x)
```



5. ToDo 4

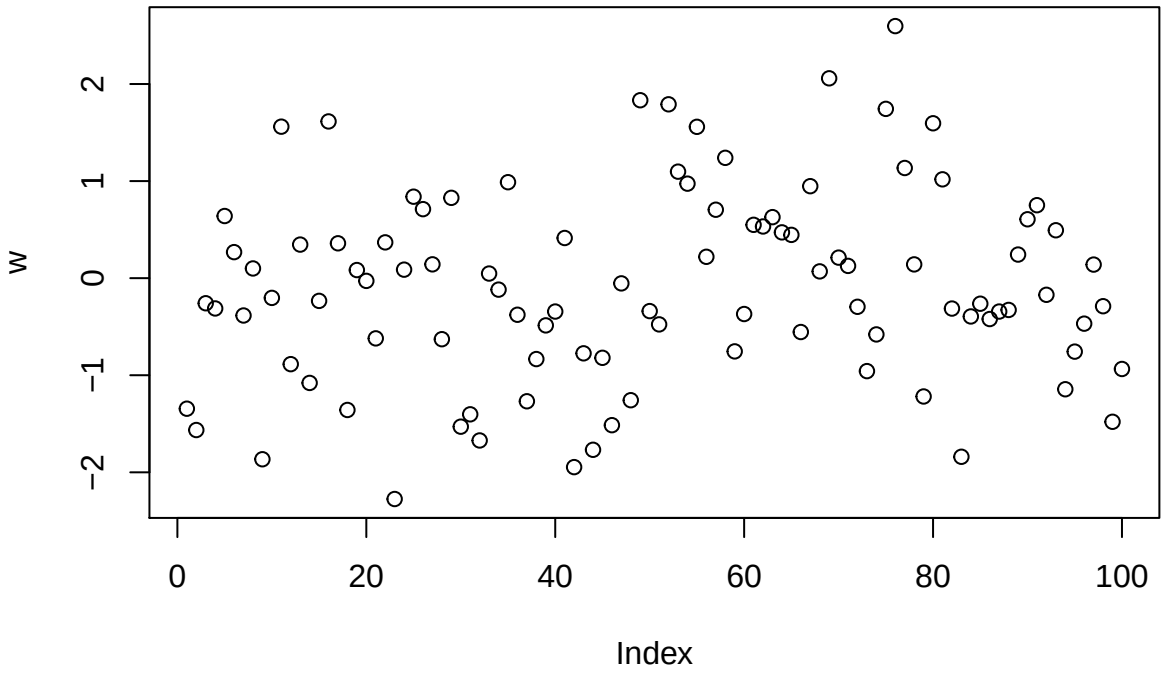
```
help(sqrt)
```

```
f <- function(x) {
  # code would go here...
}
```

6. ToDo 5

File > New File > RScript > Save > firstscript.R

```
w=rnorm(100)
plot(w)
```



Run the script several times:

source("firstscript.R")
source("firstscript.R")
source("firstscript.R")
source("firstscript.R")

Each run produces a different graph.

7. ToDo 6.2

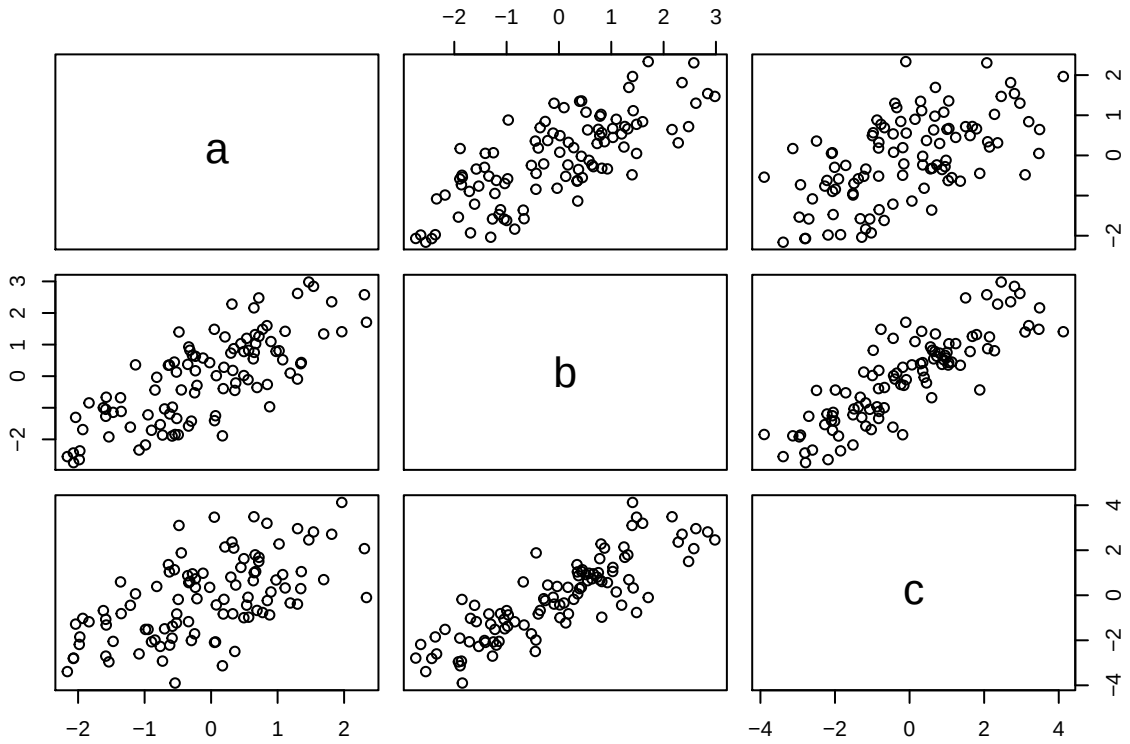
```
P = seq(from=31, to = 60, by = 1)
Q = matrix(data=P, ncol=5, nrow=6)
```

8. ToDo 6.3

File > New File > RScript > Save > dataframe.R

```
x1 = c(rnorm(100))
x2 = c(rnorm(100))
x3 = c(rnorm(100))

t = data.frame(a=x1, b=x1+x2, c= x1+x2+x3)
plot(t)
```




```
sd(as.numeric(as.matrix(t)))
```

```
## [1] 1.431261
```

Run the script several times:

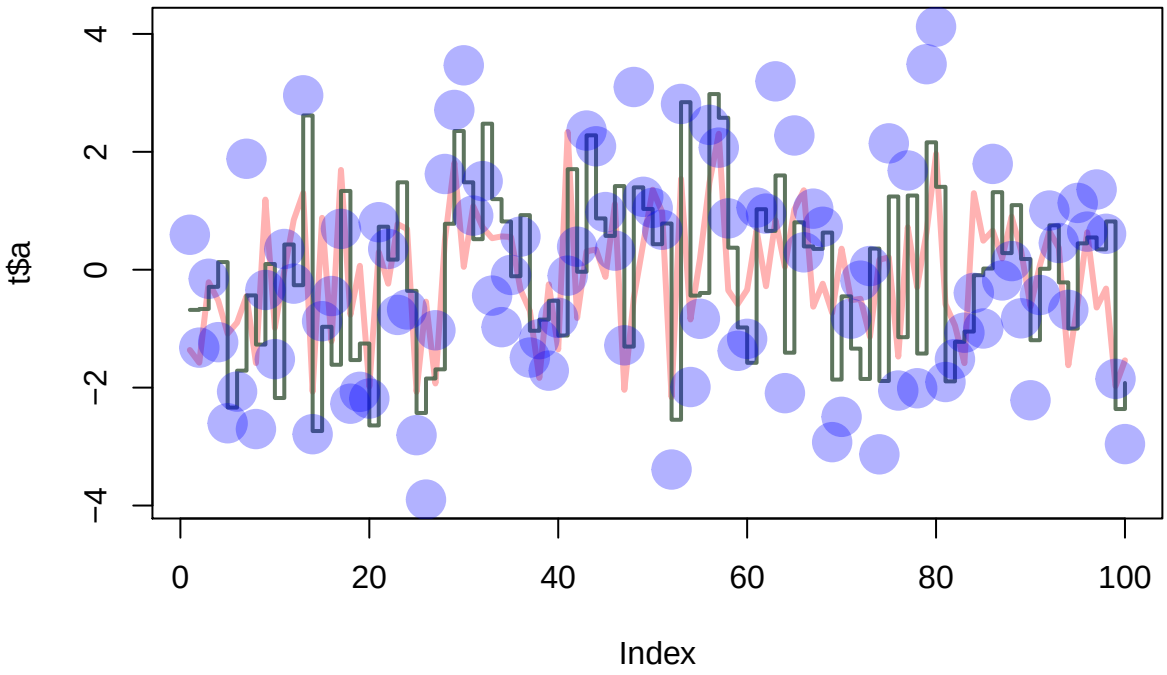
source("dataframe.R")
source("dataframe.R")
source("dataframe.R")
source("dataframe.R")

Each run produces a different graph.

9. ToDo 7

* append the following to dataframe.R

```
plot(t$a, type="l", ylim=range(t),lwd=3, col=rgb(1,0,0,0.3))
lines(t$b, type="s", lwd=2, col=rgb(0.3,0.4,0.3,0.9))
points(t$c, pch=20, cex=4,col=rgb(0,0,1,0.3))
```



10.

ToDo 8

File > New File > Text File > Save > kay.txt
a g x
1 2 3
2 4 6
4 8 12
8 16 24
32 64 96

File > New File > RScript > Save > readfile.R

var1 = read.table(file="kay.txt", > header=TRUE)
g = as.matrix(var1[,2])*5
write.table(g, file="kay2.txt")

11. ToDo 9

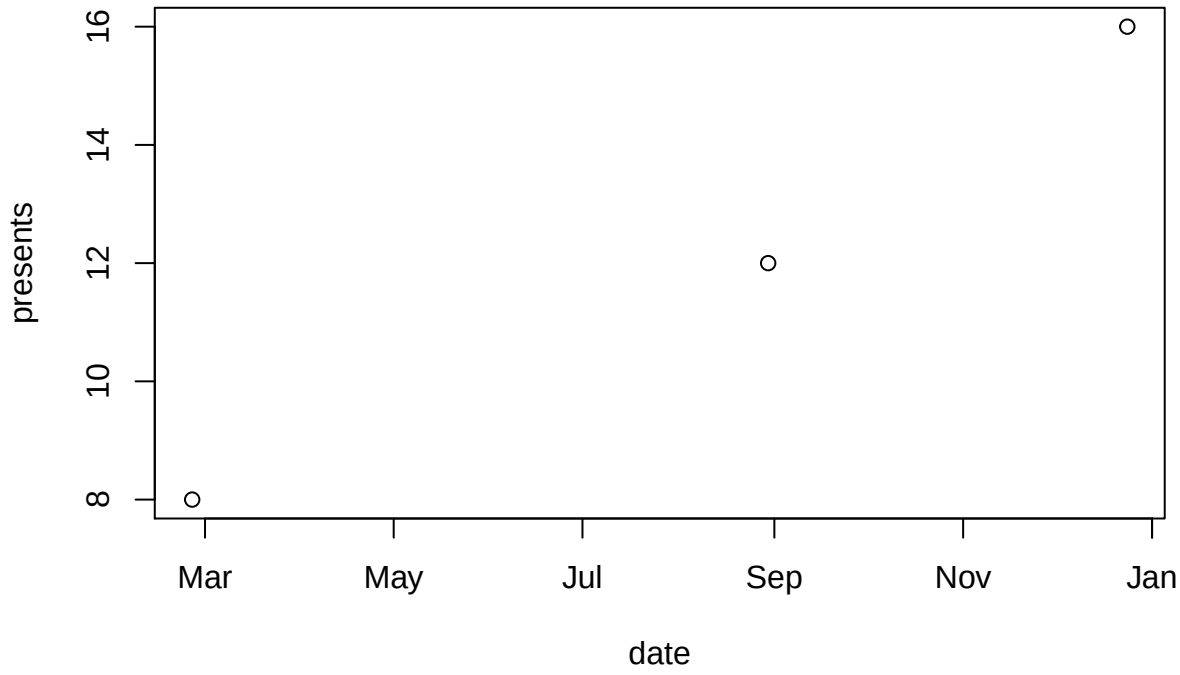
```
mean(sqrt(rnorm(100)))
```

```
## Warning in sqrt(rnorm(100)): NaNs produced
```

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

12. ToDo 10.2

```
presents = c(8, 16, 12)
date = strptime(c("20180224203000", "20181224000000", "20180830000000"), format="%Y%m%d%H%M%S")
plot(date, presents)
```



13.

ToDo 11.2

```
vect = seq(from=1, to=100)
s = c()
for (i in 1:length(vect))
{
  if (vect[i] <= 5)
  {
     s[i] = vect[i] * 10
  }
  else if (vect[i] >= 90)
  {
    s[i] = vect[i] * 10
  }
  else
  {
    s[i] = vect[i] * 0.1
  }
}
s
```

```
##   [1]   10.0   20.0   30.0   40.0   50.0    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  900.0
##  [91]  910.0  920.0  930.0  940.0  950.0  960.0  970.0  980.0  990.0 1000.0
```

14. ToDo 11.3

```
funckay = function(vect)
{
     s = c()
    for (i in 1:length(vect))
    {
        if (vect[i] <= 5)
        {
            s[i] = vect[i] * 10
        }
        else if (vect[i] >= 90)
        {
            s[i] = vect[i] * 10
        }
        else
        {
            s[i] = vect[i] * 0.1
        }
    }
    return (s)
}
```

```
funckay(vect)
```

```
##   [1]   10.0   20.0   30.0   40.0   50.0    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  900.0
##  [91]  910.0  920.0  930.0  940.0  950.0  960.0  970.0  980.0  990.0 1000.0
```

15. One More Thing ToDo

```
c(vect[1:5]*10,vect[6:89]*0.1,vect[90:100]*10)
```

```
##   [1]   10.0   20.0   30.0   40.0   50.0    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  900.0
##  [91]  910.0  920.0  930.0  940.0  950.0  960.0  970.0  980.0  990.0 1000.0
```