SRT411 Assignment0

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February 16,2018

Github username: MRajput1 ###Introduction This file shows the solution to taks provided in "A (very) short introduction to R" BY Paul Torfs & Claudia Brauer. This is part of Assignment 0 for SRT411, Fall semester at Seneca College.

link to document

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

Todo 1

Compute the difference between 2084 and the year you started at Seneca Colelge and divide this by the difference between 2018 and the year you were born. Multiply this with 100 to get the percentage of your life you have spent at this university. Use brackets if you need them.

```
((2018-2017)/(2018-1998))*100
```

```
## [1] 5
```

Todo2

Repeat the previous ToDo, but with several steps in between. You can give the variables any name you want, but the name has to start with a letter.

```
years_college = 2018-2017
years_life = 2018-1998
college_to_life = (years_college/years_life)*100
college_to_life
```

```
## [1] 5
```

Todo3

Compute the sum of 4, 5, 8 and 11 by first combining them into a vector and then using the function sum.

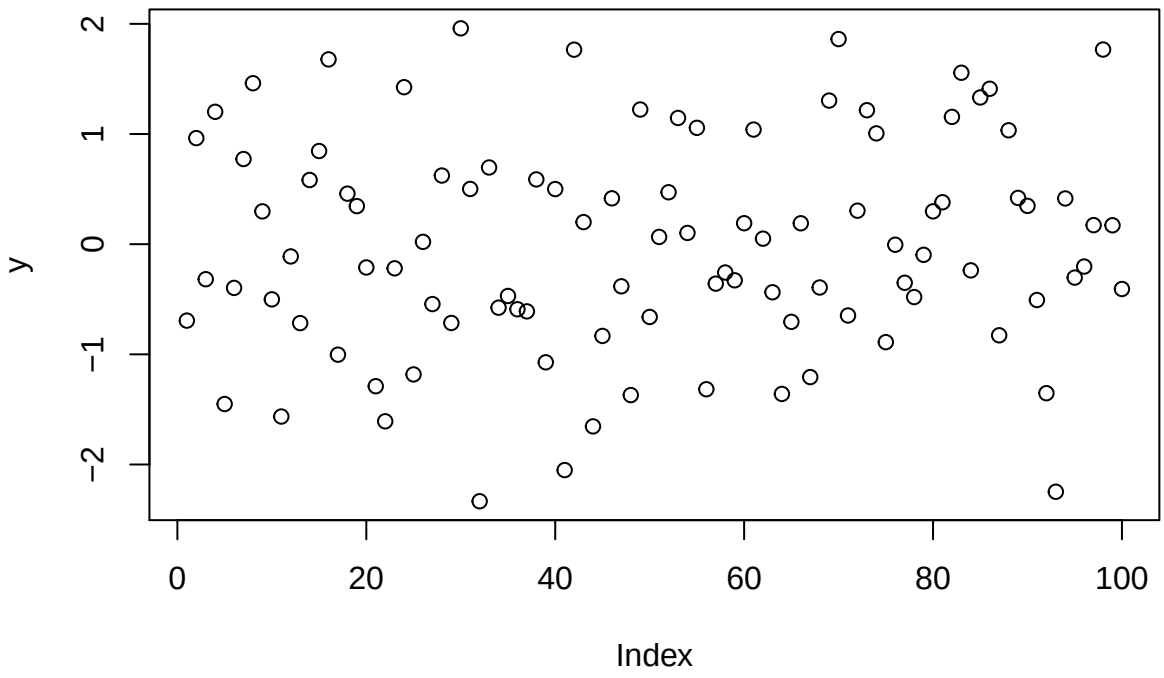
```
b=c(4,5,8,11)
sum(b)
```

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

Todo4

Plot 100 normal random numbers.

```
y=rnorm(100)
plot(y)
```



Todo5

Find help for the sqrt function.

```
help("sqrt")
```

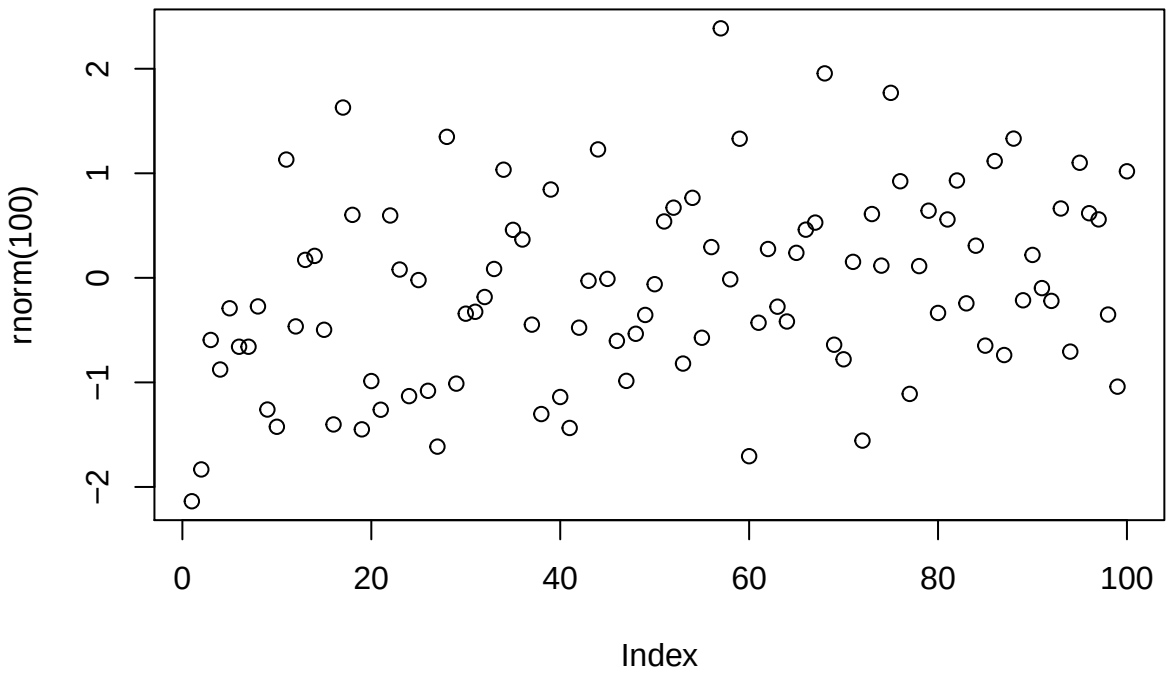
```
## starting httpd help server ... done
```

Todo6

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

```
 # content of firstscript.R  this file shoul be present in working directory.
 # plot(rnorm(100))

source("firstscript.R")
```



Todo7

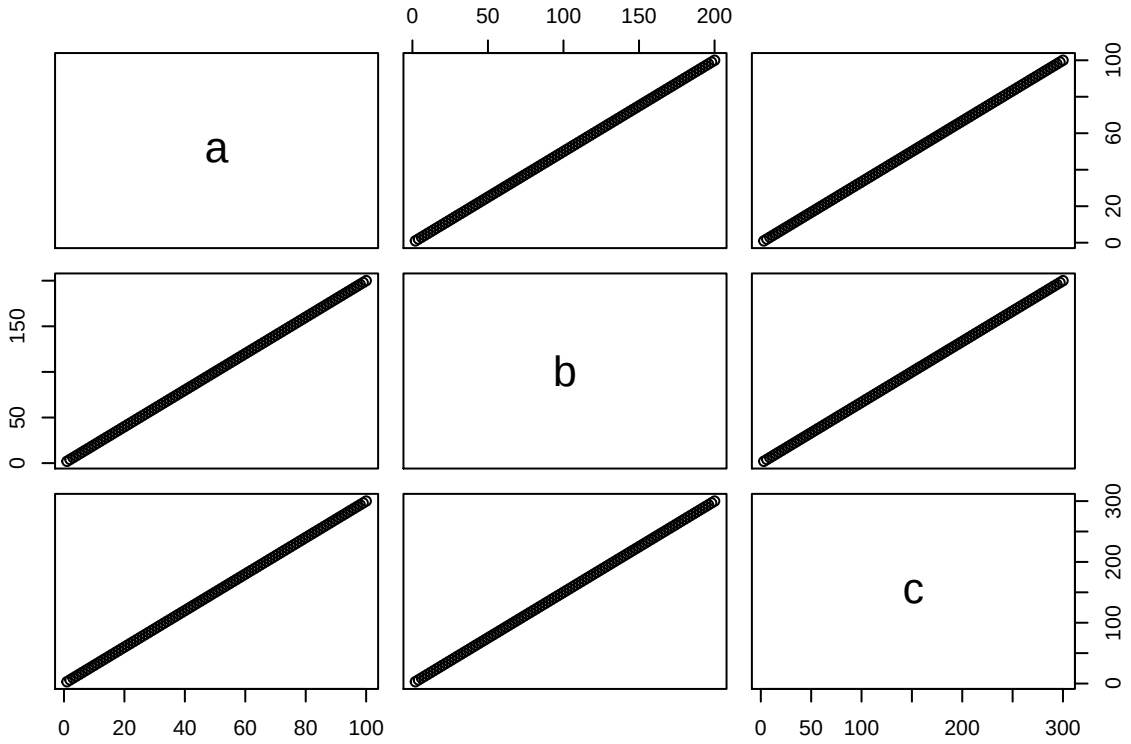
Put the numbers 31 to 60 in a vector named P and in a matrix with 6 rows and 5 columns named Q. Look at the different ways scalars, vectors and matrices are denoted in the workspace window.

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

Todo8

Make a script file which constructs three random normal vectors of length 100. Call these vectors x1, x2 and x3. Make a data frame called t with three columns (called a, b and c) containing respectively x1, x1+x2 and x1+x2+x3. Call the following functions for this data frame: plot(t) and sd(t)

```
x1 = seq(1:100)
x2 = seq(1:100)
x3 = seq(1:100)
t= data.frame(a=x1, b=x1+x2, c=x1+x2+x3)
plot(t)
```




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

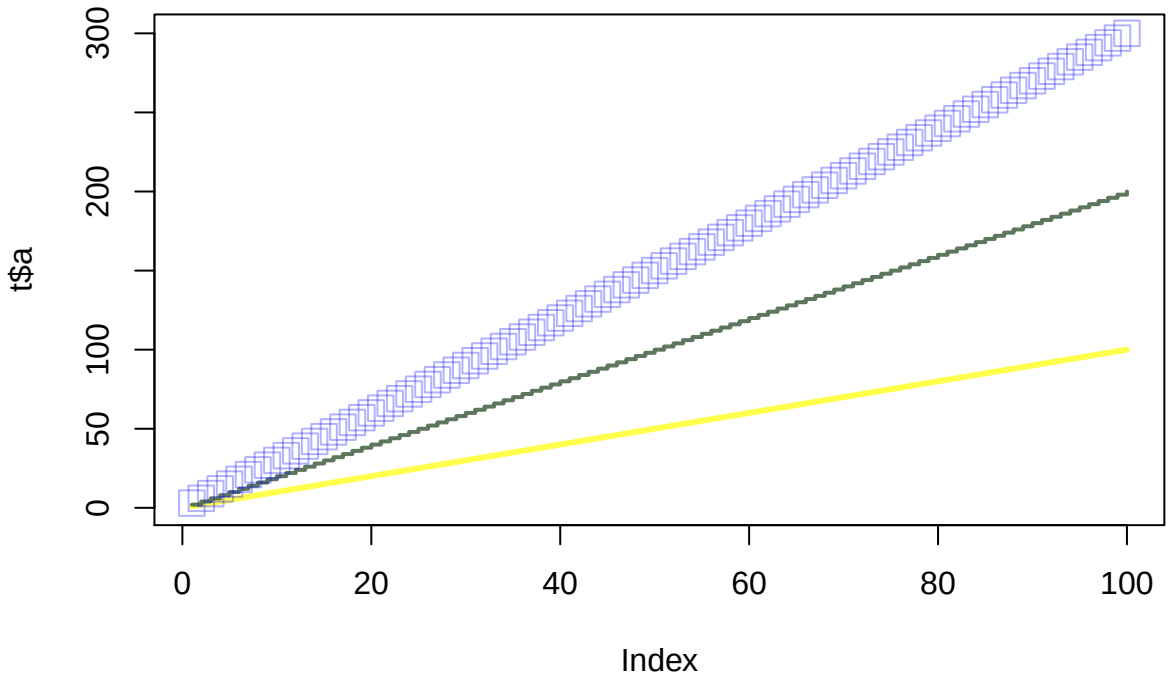
```
## [1] 74.88229
```

Todo9

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

rgb function creates colors corresponding to the given intensities (between 0 and max) of the red, green and blue primaries. **lwd** defines the line width or graph. **pch** is plotting 'character', i.e., symbol to use. This can either be a single character or an integer code for one of a set of graphics symbols. **cec** For other text symbols, cex = 1 corresponds to the default fontsize of the device, often specified by an argument pointsize. For pch in 0:25 the default size is about 75% of the character height (see par("cin"))

```
plot(t$a, type="l", ylim=range(t),lwd=3, col=rgb(1,1,0,0.7))
lines(t$b, type="s", lwd=2,col=rgb(0.3,0.4,0.3,0.9))
points(t$c, pch=22, cex=2,col=rgb(0,0,1,0.3))
```



Todo10

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, to multiply the column called g by 5 and to store it as tst2.txt.

```
d=data.frame(a=c(1,2,4,8,16,32),g=c(2,4,8,16,32,64),x=c(3,6,12,24,48,96))
write.table(d,file="tst1.txt",row.names=FALSE)
t = read.table("tst1.txt",header = TRUE)
t2=data.frame(a=t$a, g=t$g*5, x=t$x)
write.table(t2,file="tst2.txt",row.names=FALSE)
```

Todo11

Compute the mean of the square root of a vector of 100 random numbers. What happens? **"mean(sqrt(rnorm(100)))"** gives an error message as rnorm produces negative random numbers too.

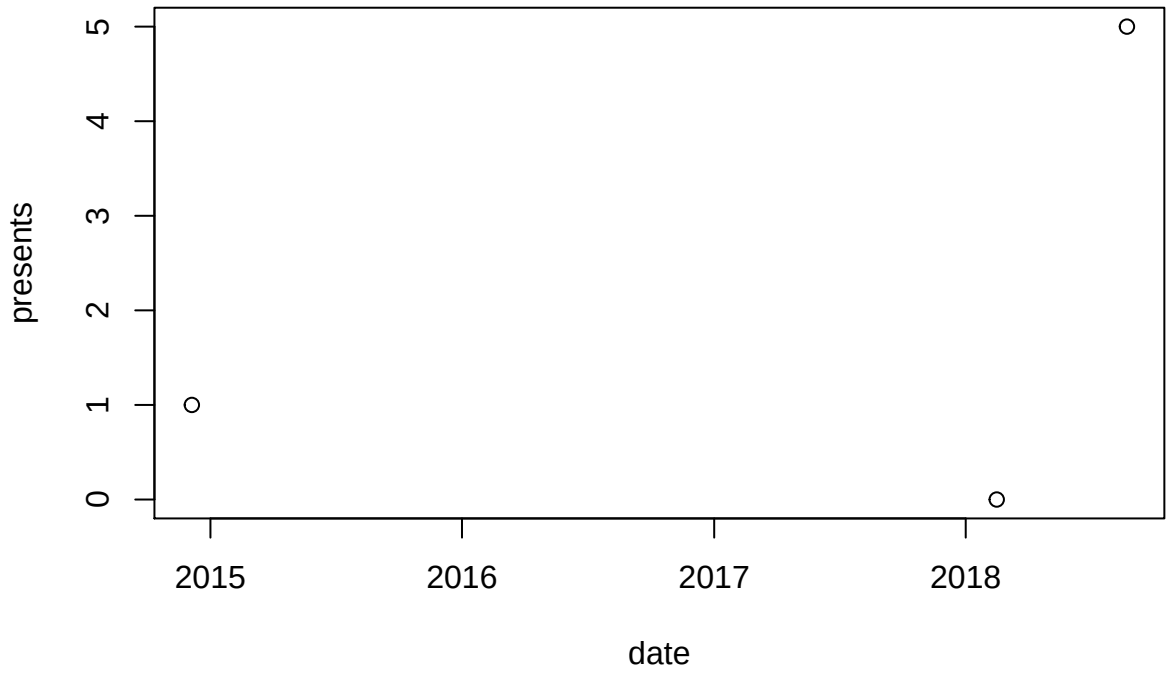
```
mean(sqrt(rnorm(100)+10))
```

```
## [1] 3.144197
```

Todo12

Make a graph with on the x-axis: today, Sinterklaas 2014 and your next birthday and on the y-axis the number of presents you expect on each of these days. Tip: make two vectors first.

```
date=strptime(c("20180215","20141205","20180823"),format = "%Y%m%d")
presents=c(0,1,5)
plot(date,presents)
```



Todo13

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

```
vector=seq(1:100)
vector2=c()
for(i in 1:100)
{
    if(vector[i]<5)
        { vector2[i]=vector[i]*5 }
    else if(vector[i]>90)
        { vector2[i]=vector[i]*10; }
    else
        { vector2[i]=vector[i]*0.1; }
 }
vector2
```

```
##   [1]    5.0   10.0   15.0   20.0    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
```

Todo14

Write a function for the previous ToDo, so that you can feed it any vector you like (as argument). Use a for-loop in the function to do the computation with each element. Use the standard R function length in the specification of the counter

```
z=1:100
fun = function(arg1)
{
    l = length(arg1)
    for(i in 1:l)
    {
        if (arg1[i] < 5)
            { arg1[i] = arg1[i] * 5 }
        else if (arg1[i] > 90)
            { arg1[i] = arg1[i] * 10}
        else
            { arg1[i] = arg1[i] * 0.1 }
    }
return (arg1)
}
fun(z)
```

```
##   [1]    5.0   10.0   15.0   20.0    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
```

Todo15

perform the above ToDo without a for-loop but with regular vectorcomputations.

```
z=1:100
fun = function(arg1)
{
     arg1 = c(arg1[1:4]*5, arg1[5:90]*0.1, arg1[91:100]*10)
return (arg1)
}
fun(z)
```

```
##   [1]    5.0   10.0   15.0   20.0    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
```

Refrences:

[1] http://kbroman.org/knitr_knutshell/pages/markdown.html [2] https://nicercode.github.io/guides/reports/ [3] https://www.youtube.com/watch?v=DNS7i2m4sB0 [4] https://www.dataquest.io/blog/how-to-share-data-science-portfolio/