SRT411-A0

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Acknowledged Sources R Markdown cheat sheet - https://www.rstudio.com/wp-content/uploads/2015/02/rmarkdo
ggplot 2 - http://statmodeling.com/best-way-to-add-a-footnote-to-a-plot-created-with-ggplot2.html
My_knitr.Rmd - by Mike Martin

The username created for this github account is ldyer1. This assignment entails a series of R Programming exercises which include mathematical calculations, matrices, plots and sequences.

3.1 Calculator Compute the difference between 2014 and the year you started at university and divide this by the difference between 2014 and the year you were born. Multiply this with 100 to get the percentage of your life spent at university. ((2014-2014)/(2014-1992)) * 100

```
((2014-2014)/(2011-1992)) * 100
```

```
## [1] 0
```

3.1 Workspace Repeat previous example but with several steps in between. grad = 2018 entranceyr = 2013 birth_year = 1992 x <- grad - entranceyr /entranceyr - birth_year

```
grad = 2018
entranceyr = 2013
birth_year = 1992
x <- grad - entranceyr /entranceyr - birth_year
x
```

```
## [1] 25
```

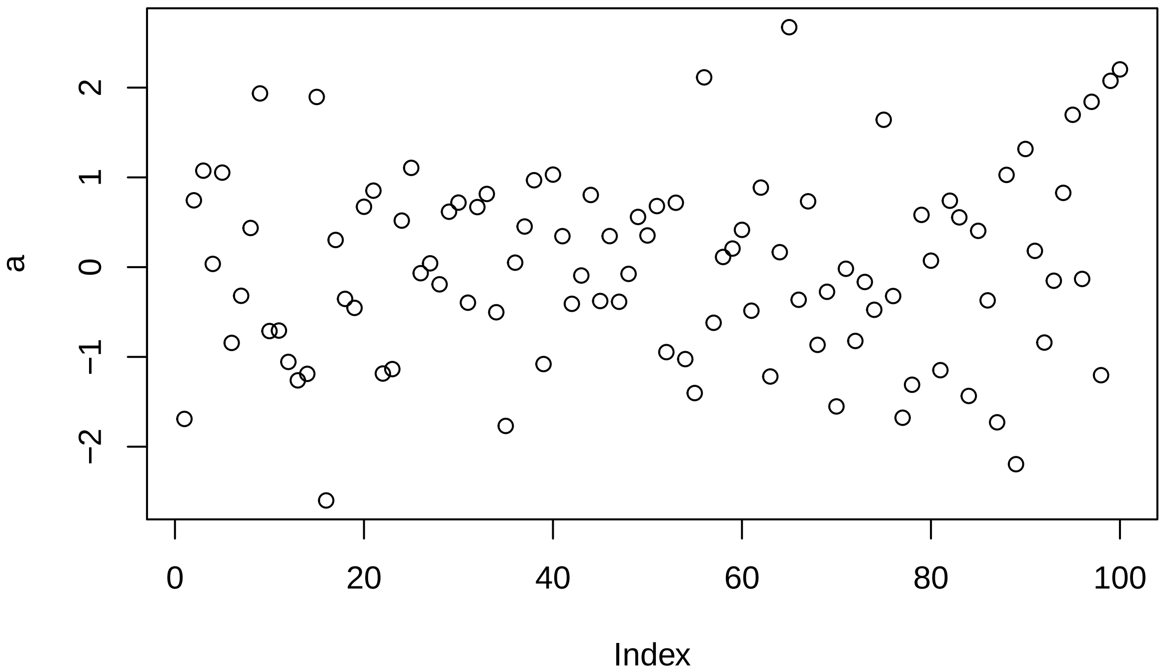
3.4 Functions
Compute the sum of 4,5,8, and 11
y <- c(4,5,8,11)
sum(y)

```
y <- c(4,5,8,11)
sum(y)
```

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

3.5 Plots Plot 100 normal random numbers a = rnorm(100) plot(a)

```
a = rnorm(100)
plot(a)
```

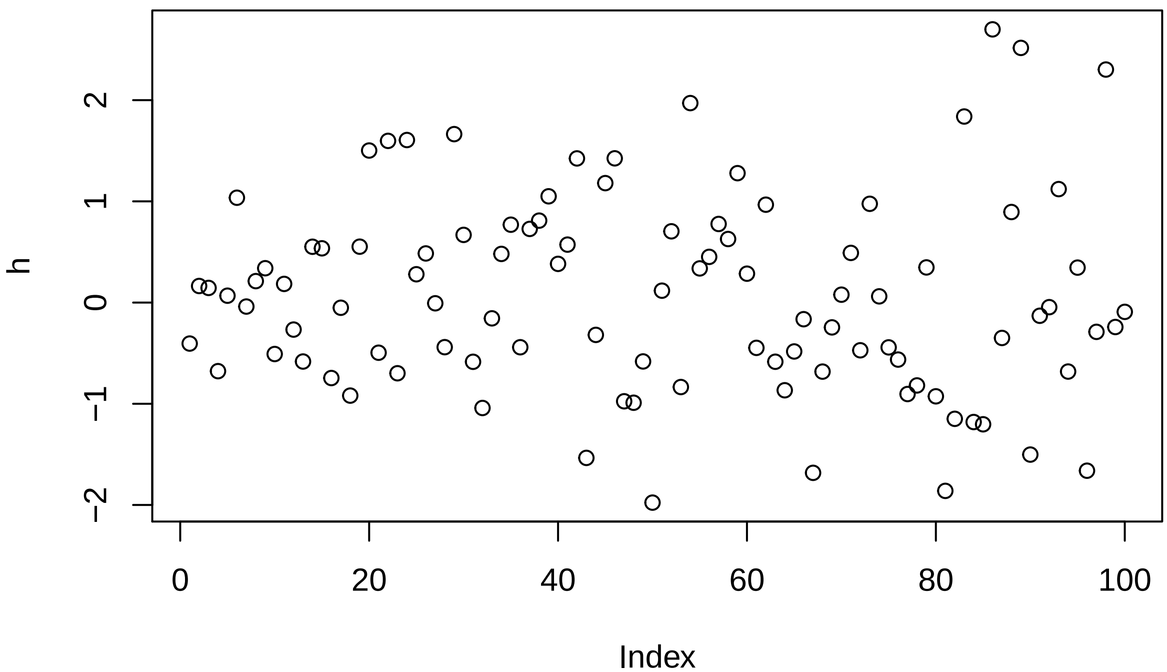


4 Help and Documentation Find help for the sqrt function help(sqrt)

```
help(sqrt)
```

5 Scripts Make a file called 'firstscript.R' containing R-Code that generates 100 random numbers and plots them and run this script several times. x <-rnorm(100) plot (h) source("firstscript.R

```
h <-rnorm(100)
plot (h)
```



6.2 Matrices Put the numbers 31 to 60 in a vector named P and in a matrix with 6 rows and 5 columns named Q. Tip: use the function seq. Look at the different ways scalars, vectors and matrices are denoted in the workspace window. P <- c(31:60) mat=matrix(data=P,ncol=5,nrow=6) mat

```r
P <- c(31:60)
mat <- matrix(data=P,ncol=5,nrow=6)
mat
```

```
##      [,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
```

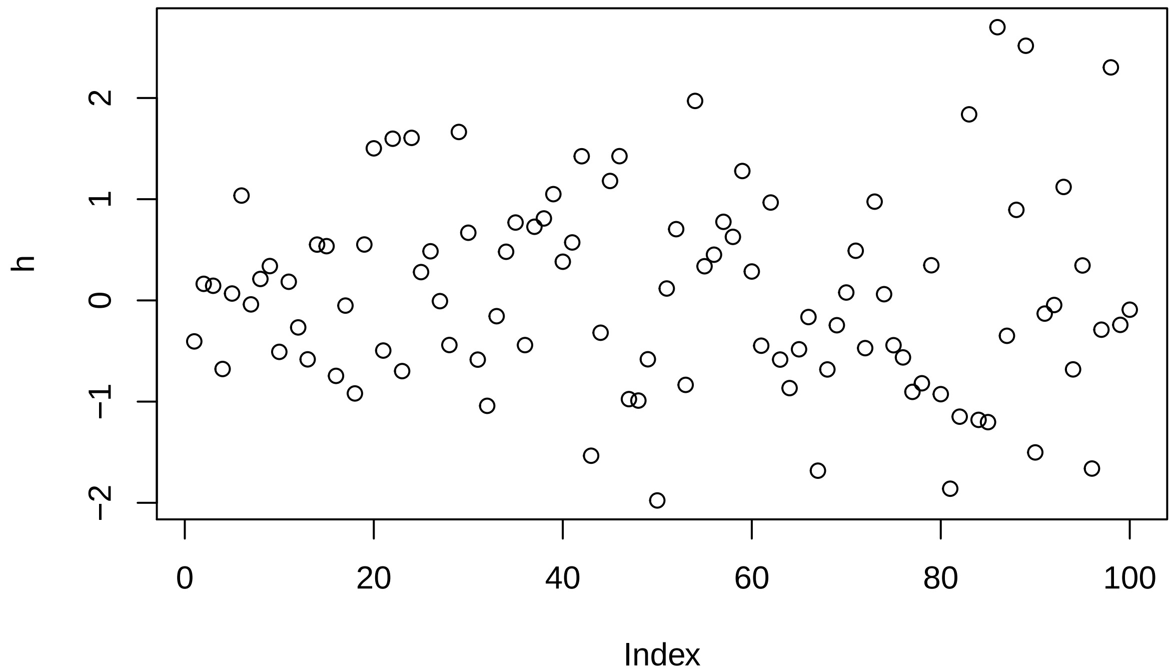
6.3 Data Frames Make a script file which constructs three random normal vectors of length 100. Call these vectors x1, x2 and x3. Make a data frame called t with three columns (called a, b and c) containing respectively x1, x1+x2 and x1+x2+x3. Call the following functions for this data frame: plot(t) and sd(t). Can you understand the results? Rerun this script a few times.

```r
x1 <- c(100)
x2 <- c(100)
x3 <- c(100)

a <- x1
b <- x1 + x2
c <- x1 + x2 + x3
u <- data.frame(a,b,c)
h
```

```
##   [1] -0.405044723  0.163728256  0.144694223 -0.677710032  0.067897566
##   [6]  1.035901822 -0.039331841  0.211823510  0.339428896 -0.508390907
##  [11]  0.184163909 -0.266818028 -0.582486013  0.551483280  0.535990778
##  [16] -0.745767957 -0.051090395 -0.919284561  0.552444697  1.502449467
##  [21] -0.495462788  1.597729098 -0.698564594  1.606007044  0.279811320
##  [26]  0.485348890 -0.007225607 -0.440619151  1.664252584  0.668581208
##  [31] -0.585308477 -1.041719399 -0.155806015  0.480522796  0.769427057
##  [36] -0.441541374  0.727806595  0.809699479  1.049997707  0.382303716
##  [41]  0.572559007  1.424489672 -1.534671811 -0.319312829  1.180256088
##  [46]  1.425081453 -0.975326686 -0.989829149 -0.581760574 -1.976606024
##  [51]  0.117560499  0.704109170 -0.834667239  1.970910932  0.337444063
##  [56]  0.451739936  0.776546054  0.627795214  1.278578792  0.285636050
##  [61] -0.447486391  0.967222584 -0.584628797 -0.866531449 -0.483095662
##  [66] -0.164284131 -1.682415076 -0.682137046 -0.245243766  0.077973771
##  [71]  0.490651902 -0.471637222  0.975984033  0.061321198 -0.442805555
##  [76] -0.563331751 -0.903640128 -0.818715324  0.347276950 -0.926402900
##  [81] -1.860540738 -1.148696318  1.838459026 -1.180327646 -1.202794119
##  [86]  2.699517489 -0.349784759  0.894756929  2.516235820 -1.501984894
##  [91] -0.130435178 -0.045487298  1.121063311 -0.681587504  0.345405075
##  [96] -1.661357643 -0.289376764  2.302562713 -0.241671499 -0.091742125
```

```r
plot(h)
```




```
sd(h)
```

```
## [1] 0.9633626
```

```
#8. Reading and writing data files
d = data.frame(a = c(3,4,5))
b = c(12,43,54)
write.table(d, file="tst1.txt", row.names=FALSE)
d2 = read.table(file="tst1.txt", header=TRUE)
d2
d = data.frame(a = c(3,4,5))
b = c(12,43,54)
write.table(d, file="tst1.txt", row.names=FALSE)
d2 = read.table(file="tst1.txt", header=TRUE)
d2
```

```
#9. Not available data
Compute the mean of the square root of a vector of 100 random numbers.
a <-sqrt(rnorm(100)
a
```

```
a <-sqrt(rnorm(100))
```

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

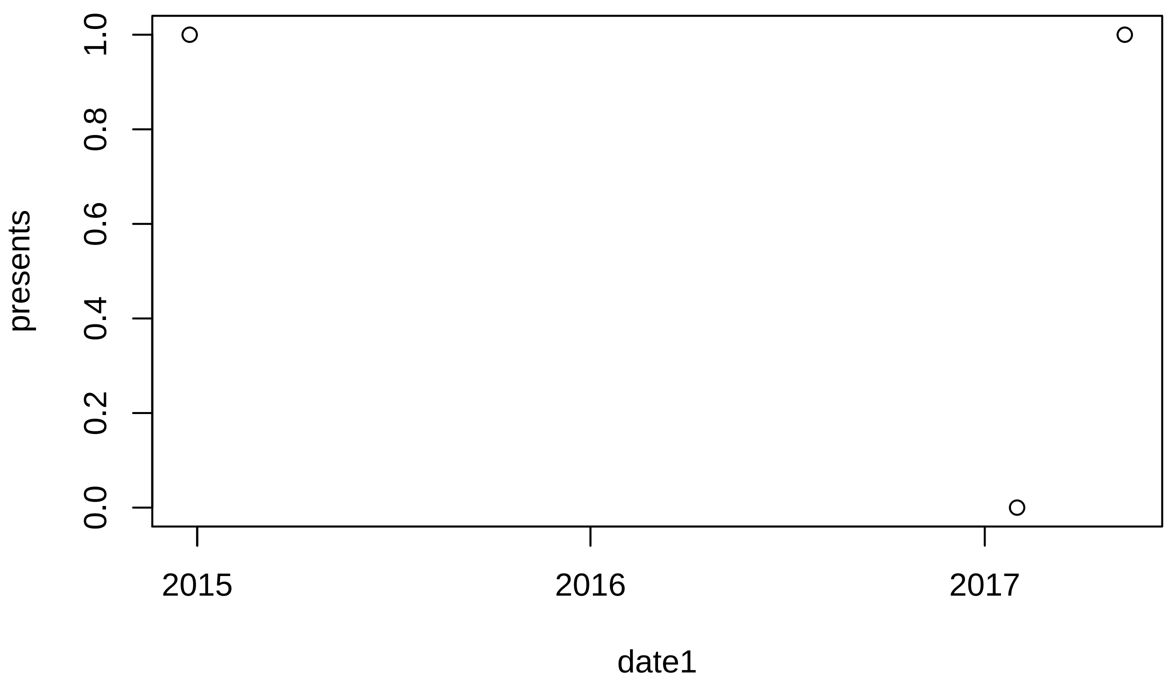
```
a
```

```
##   [1]       NaN 1.4939112       NaN       NaN 0.8381550       NaN 0.5811669
##   [8]       NaN 0.3706097 0.8001878 1.1319136 0.8807929       NaN       NaN
##  [15]       NaN       NaN 0.8313661 0.4594304       NaN       NaN       NaN
##  [22] 0.9143337       NaN       NaN       NaN       NaN 0.9048818       NaN
##  [29] 0.4502783 1.0400414 0.7719752       NaN       NaN 0.8366583       NaN
##  [36]       NaN       NaN       NaN 1.0324816 0.7770701       NaN 0.9663049
##  [43] 1.1352979       NaN       NaN 0.6543649 0.8573631 1.4713090 1.1131844
##  [50] 1.1563792       NaN 1.4101539       NaN       NaN       NaN 0.3626970
##  [57] 1.0803110       NaN 0.5786902       NaN       NaN       NaN 0.2307873
```

```
## [64] 0.5349114       NaN       NaN 0.8537014       NaN       NaN 1.0354798
## [71]       NaN 0.6636439 0.8808549 0.6577154       NaN 0.5346253 0.9886419
## [78]       NaN       NaN 1.2749845 1.2042759 0.5630482       NaN       NaN
## [85] 0.7109632       NaN       NaN       NaN 0.9824105 1.0808645       NaN
## [92]       NaN       NaN 1.0599067 0.9068582       NaN 0.2338112 0.9279388
## [99]       NaN       NaN
```

10.2 Dates
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.
date1=strptime(c("20170131","20141225", "20170511"),format="%Y%m%d")
presents <- c(0,1,1)
datevspresents <- plot(x = date1, y = presents)
datevspresents

```r
date1=strptime( c("20170131","20141225", "20170511"),format="%Y%m%d")
presents <- c(0,1,1)
datevspresents <- plot(x = date1, y = presents)
```




```r
datevspresents
```

```
## NULL
```

#11.2 For-Loop
####Make a vector from 1 to 100. Make a for-loop ####which runs through the whole vector. Multiply ####
####```{r, echo=FALSE} ####j = seq(from=1, to=100) ####s= c() ####for (i in 1:100)
{
  s[i] < 5 = j[i] > 90 * 10
}

####s ####```
#The final Todo in the document has a footnote. Write code that will prove that footnote true
####l <- annotate("info", label = "Footnote", colour = black) ####l