SRT411A0

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Contents

0.1 R Markdown

This is an R Markdown document. Markdown is a simple formatting syntax for authoring HTML, PDF, and MS Word documents. For more details on using R Markdown see http://rmarkdown.rstudio.com.

When you click the **Knit** button within RStudio, a document will be generated that includes both content as well as the output of any embedded R code chunks within the document.

0.2 Short Introduction

Below are ToDo codes from the published article, A (very) Short Introduction to R, by the authors, Paul Torfs and Claudia Brauer, under the Hydrology and Quantitative Water Management Group by the Wageningen University (The Netherlands) on March 3rd, 2014. R is a language for statistical computing and graphics in a public domain (GNU) project. The username on GitHub account is kleung52. A link to the document can be found at https://cran.r-project.org/doc/contrib/Torfs+Brauer-Short-R-Intro.pdf.

0.3 ToDo #1 (Calculator)

```
life=((2016-2014)/(2014-1986))*100
```

Percentage of life having spent at this university: 7.1428571%

0.4 ToDo #2 (Workspace)

```
time_on_university=2016-2014
time_base=2014-1986
life_raw=(time_on_university/time_base)
life=life_raw*100
```

Percentage of life having spent at this university: 7.1428571%

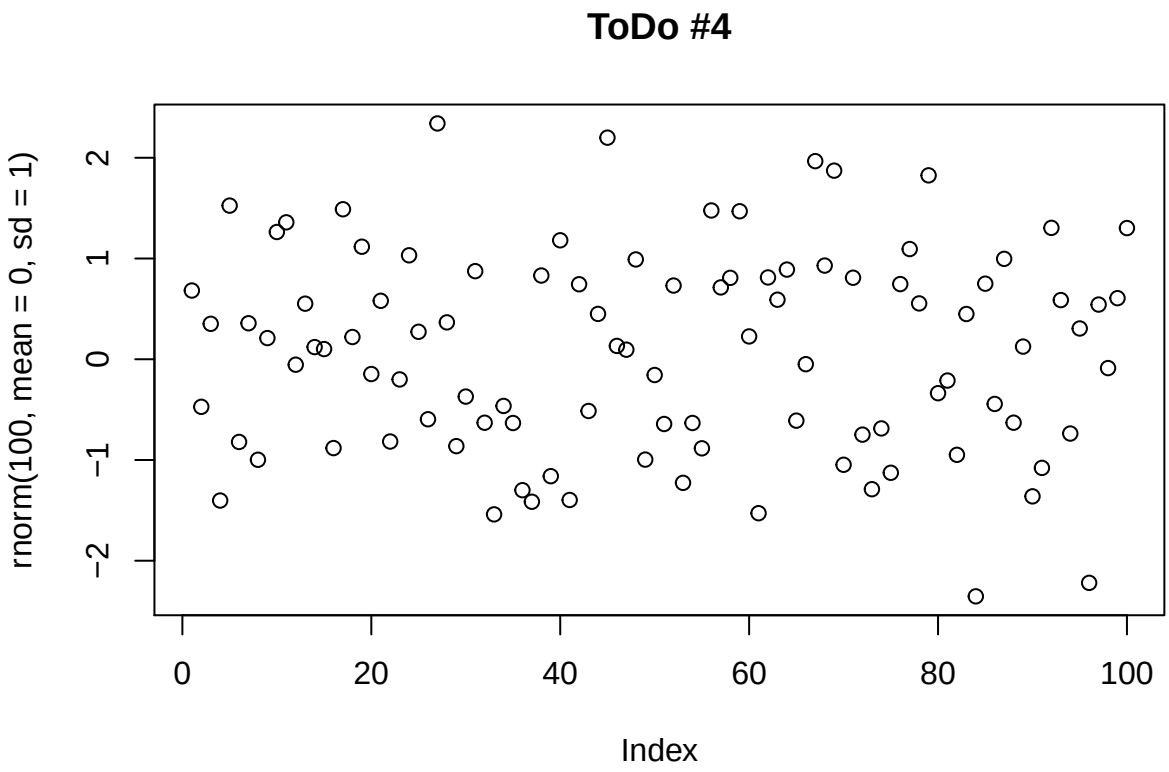
0.5 ToDo #3 (Functions)

```
b1=c(4,5,8,11)
b2=sum(b1)
```

Sum of a vector: 28

0.6 ToDo #4 (Plots)

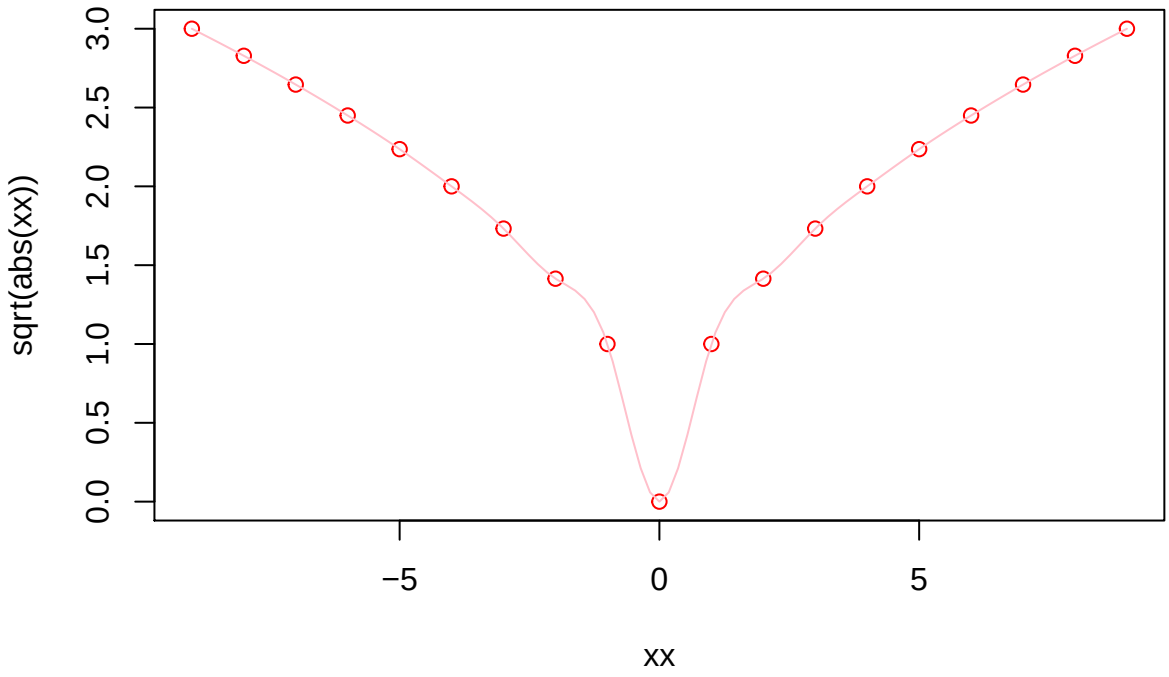
```
plot(rnorm(100,mean=0,sd=1),main="ToDo #4")
```



0.7 ToDo #5 (Help and Documentation)

```
example(sqrt)
```

```
##
## sqrt> require(stats) # for spline
##
## sqrt> require(graphics)
##
## sqrt> xx <- -9:9
##
## sqrt> plot(xx, sqrt(abs(xx)),  col = "red")
```

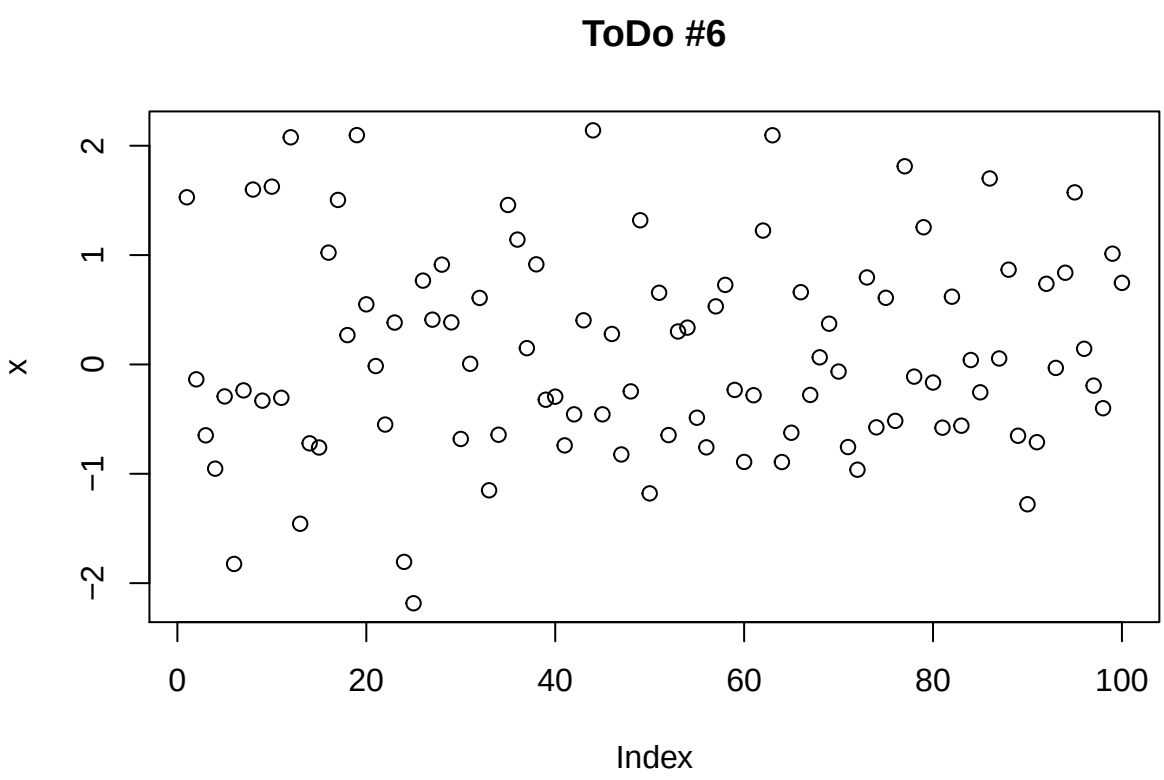



```
##
## sqrt> lines(spline(xx, sqrt(abs(xx)), n=101), col = "pink")
help(sqrt)
```

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

0.8 ToDo #6 (Scripts)

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



0.9 ToDo #7 (Vectors and Matrices)

```
P=seq(from=31,to=60,by=1)
P
```

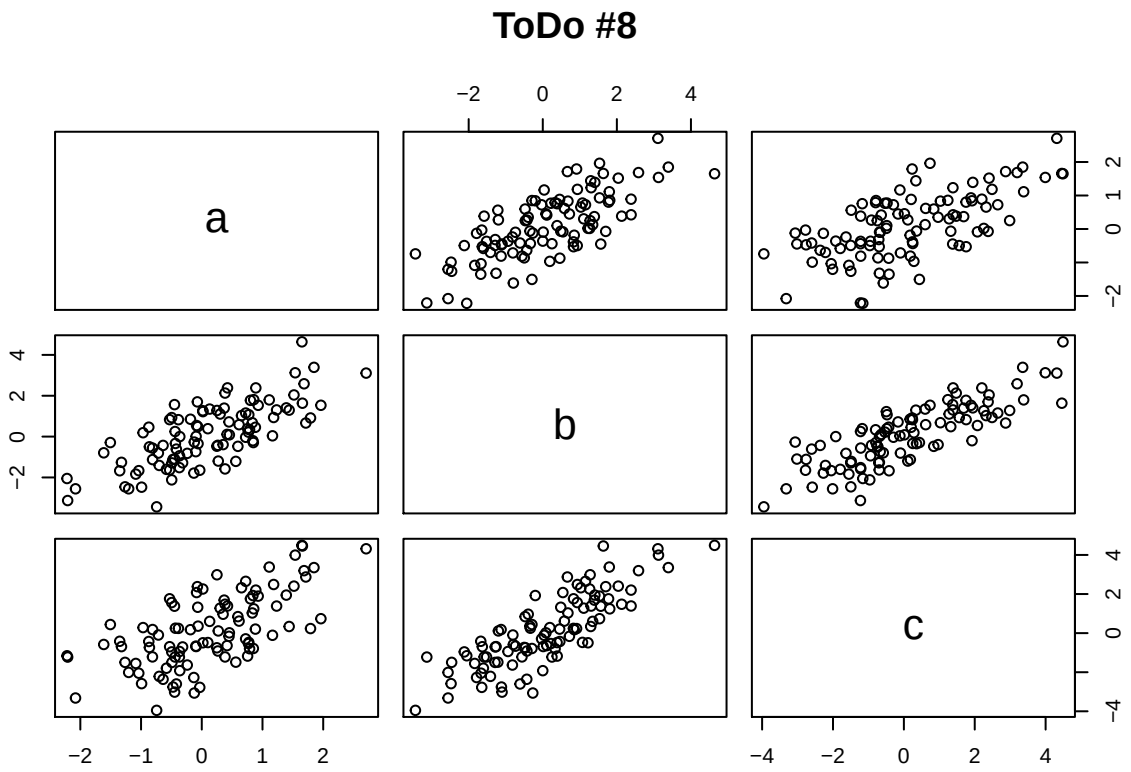
```
##  [1] 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53
## [24] 54 55 56 57 58 59 60
```

```
Q=matrix(data=P,6,5)
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
```

0.10 ToDo #8 (Data Frames)

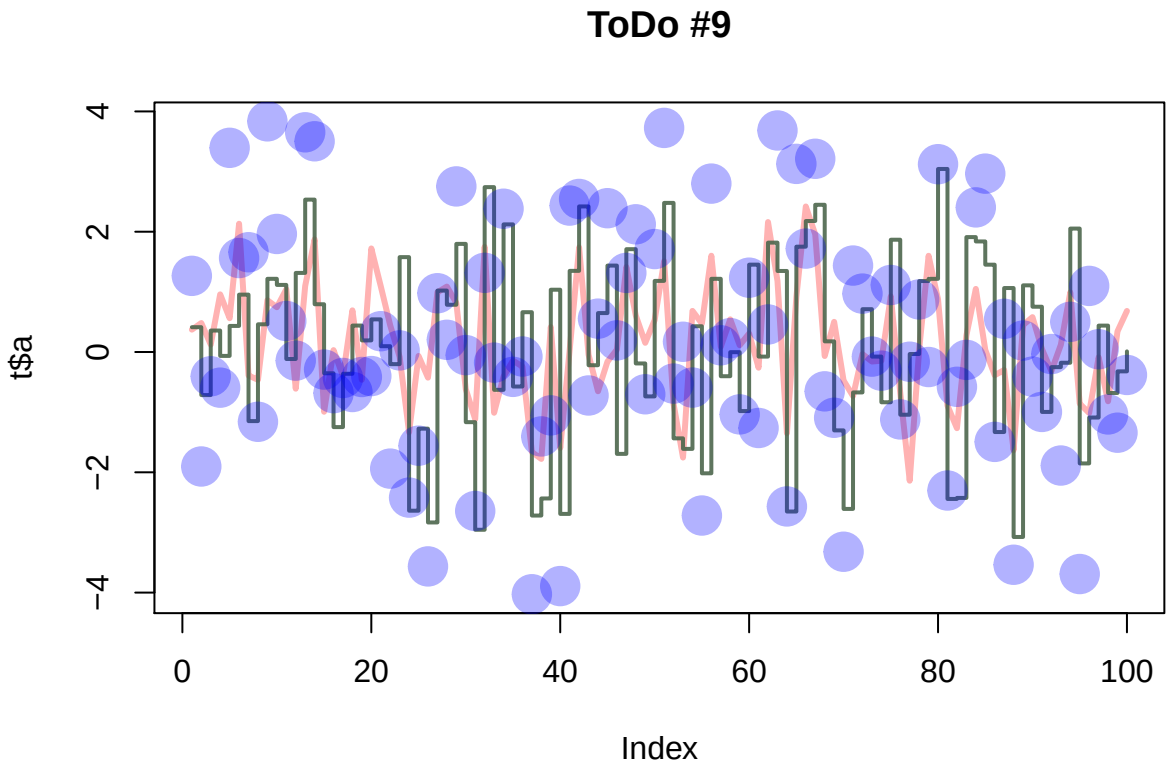
```
source("secondscript.R")
```



Standard deviation of all plot graphs: 1.4898768

0.11 ToDo #9 (Graphics)

```
source("thirdscript.R")
```




```
##
## rgb> rgb(0, 1, 0)
## [1] "#00FF00"
##
## rgb> rgb((0:15)/15, green = 0, blue = 0, names = paste("red", 0:15, sep = "."))
##     red.0     red.1     red.2     red.3     red.4     red.5     red.6
## "#000000" "#110000" "#220000" "#330000" "#440000" "#550000" "#660000"
##     red.7     red.8     red.9    red.10    red.11    red.12    red.13
## "#770000" "#880000" "#990000" "#AA0000" "#BB0000" "#CC0000" "#DD0000"
##    red.14    red.15
## "#EE0000" "#FF0000"
##
## rgb> rgb(0, 0:12, 0, max = 255) # integer input
##  [1] "#000000" "#000100" "#000200" "#000300" "#000400" "#000500" "#000600"
##  [8] "#000700" "#000800" "#000900" "#000A00" "#000B00" "#000C00"
##
## rgb> ramp <- colorRamp(c("red", "white"))
##
## rgb> rgb( ramp(seq(0, 1, length = 5)), max = 255)
## [1] "#FF0000" "#FF3F3F" "#FF7F7F" "#FFBFBF" "#FFFFFF"
```

```
help(rgb)
```

0.12 ToDo #10 (Reading and Writing Data Files)

```
textwrite=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(textwrite,file="tst1.txt")
textread=read.table(file="tst1.txt",header=TRUE)
print(textread)
```

```
##    a  g  x
## 1  1  2  3
## 2  2  4  6
## 3  4  8 12
## 4  8 16 24
## 5 16 32 48
## 6 32 64 96
```

```
textrewrite=data.frame(a=textread$a,g=textread$g*5,x=textread$x)
write.table(textrewrite,file="tst2.txt")
print(textrewrite)
```

```
##    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
```

0.13 ToDo #11 (Not Available Data)

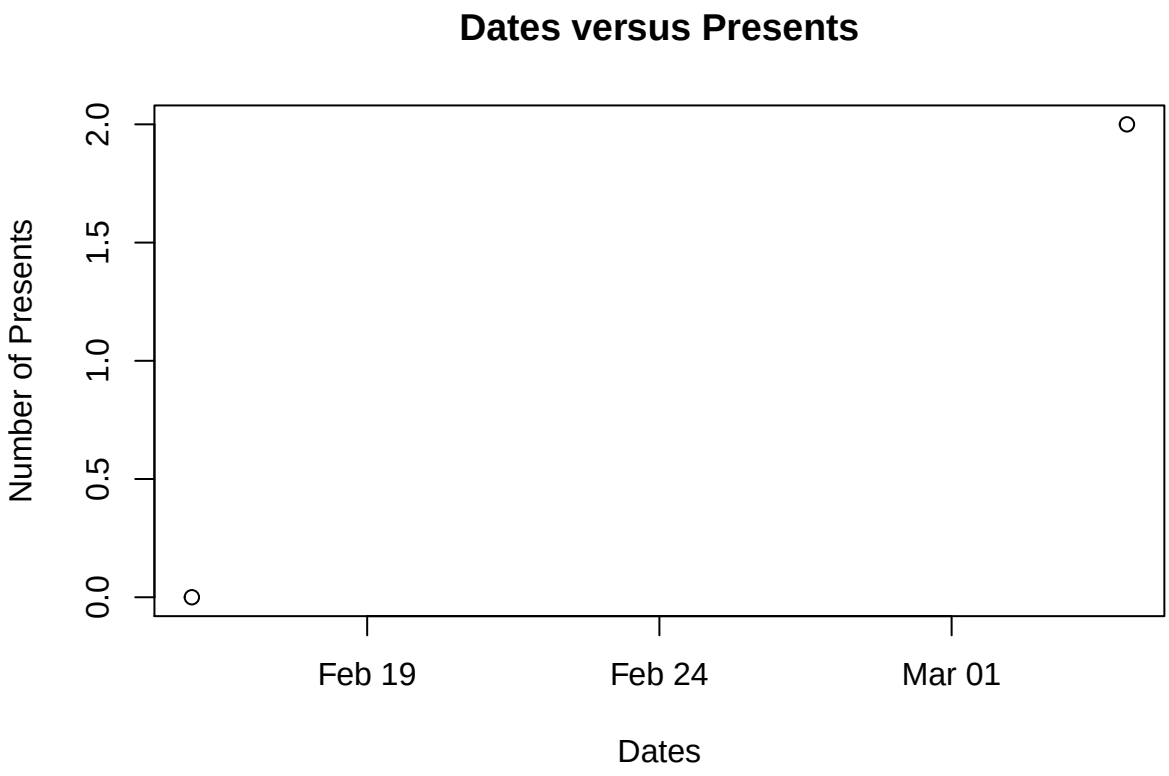
```
meansquare=mean(sqrt(c(rnorm(100))))
```

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

Mean of square root of a vector with 100 random numbers: NaN

0.14 ToDo #12 (Dates)

```
dates=strptime(c("20140216","20140304"),format="%Y%m%d")
presents=c(0,2)
plot(dates,presents,xlab="Dates",ylab="Number of Presents",main="Dates versus Presents")
```



0.15 ToDo #13 (For-Loop)

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

```
##   [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
```

0.16 ToDo #14 (Writing Your Own Functions)

```
anyv=function(arg1)
{
l=length(arg1)
for(i in 1:l)
{
  if(arg1[i]<5 | arg1[i]>90)
  {
    arg1[i]=arg1[i]*10
  }
  else
  {
    arg1[i]=arg1[i]*0.1
  }
}
return(arg1)
}
retanyv=anyv(arg1=c(rnorm(20)))
```

Example on 20 random numbers returns: 0.7324727, 24.3902808, -9.2081875, -13.9083809, -0.6044753, -8.7555628, -3.9664596, 18.9366643, -3.8359708, -3.7076015, 11.2301319, 3.1554317, 10.1677088, -7.5304838, -10.914199, -2.787139, 3.198734, 14.3050733, -4.3014637, -3.4038271

0.17 ToDo #15 (Writing Your Own Functions)

```
anyv=function(arg1,i)
{
  l=length(arg1)
  if(arg1[i]<5 | arg1[i]>90)
  {
    arg1[i]=arg1[i]*10
  }
  else
  {
    arg1[i]=arg1[i]*0.1
  }
  if(i==l)
  {
    return(arg1)
  }
  i=i+1
  anyv(arg1,i)
}
i=1
retanyv=anyv(arg1=c(seq(from=1,to=20,by=1)),i)
```

Example on 20 consecutive numbers returns: 10, 20, 30, 40, 0.5, 0.6, 0.7, 0.8, 0.9, 1, 1.1, 1.2, 1.3, 1.4, 1.5, 1.6, 1.7, 1.8, 1.9, 2

Current Time of This Paper is Fri Feb 16 10:57:30 PM 2018.

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