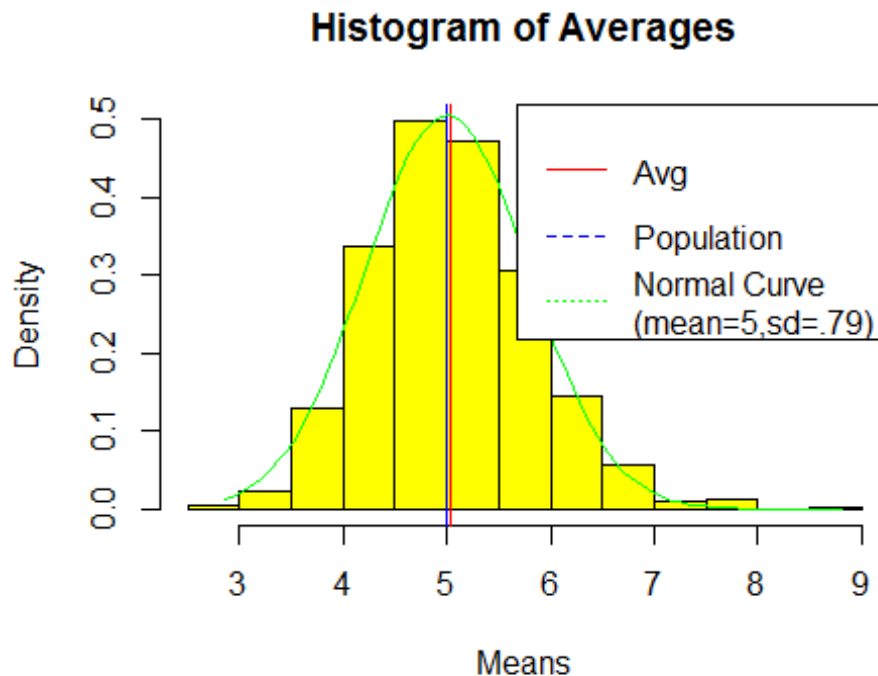


## CLT\_project.R

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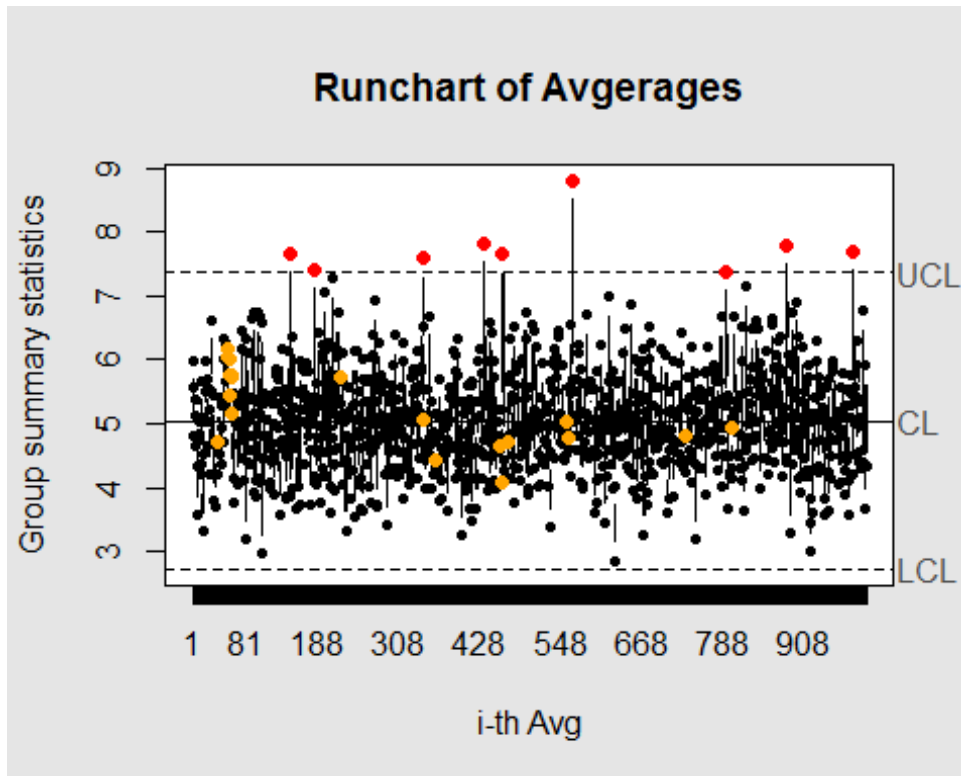
```
# creating 1000 averages from Exponential (Lambda=0.2)
x<- NULL
for(i in 1:1000) x= c(x,mean(rexp(40,.2)))
#Mean of the averages
Sm<-mean(x)
hist(x, col= "Yellow" , prob=T, main= paste("Histogram of", "Averages"),
     xlab= "Means")
abline(v=5, col= "Blue")
abline(v=mean(x), col="Red")
xf<-seq(min(x), max(x), length=100)
yf<- dnorm(xf, mean=1/.2, sd= 1/ (.2*sqrt(40)))
lines(xf,yf,col= "Green", pch=20)
legend ('topright',c("Avg", "Population", "Normal Curve
(mean=5,sd=.79)"), lty=c(1,2,3),
col= c("Red", "Blue", "Green"))
```



```
# to find normality , check run chart for static mean
library(qcc)
```

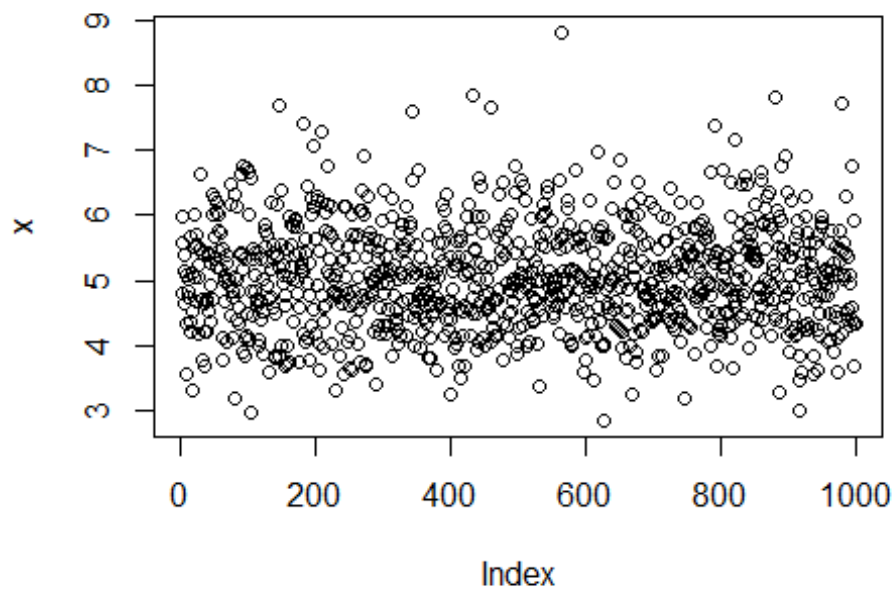
```
## Package 'qcc', version 2.6
## Type 'citation("qcc")' for citing this R package in publications.

qcc(x, type="xbar.one", center=mean(x), add.stats=FALSE,
    title="Runchart of Avgerages", xlab="i-th Avg")
```



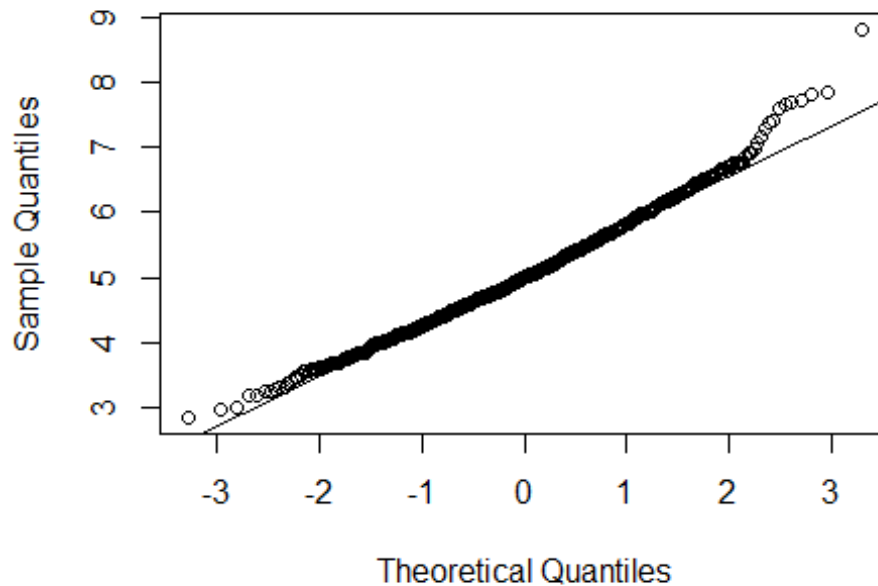
```
## List of 11
## $ call      : language qcc(data = x, type = "xbar.one", center = mean(x),
## $ type      : chr "xbar.one"
## $ data.name : chr "x"
## $ data      : num [1:1000, 1] 5.58 5.99 4.8 5.38 5.13 ...
## .. attr(*, "dimnames")=List of 2
## $ statistics: Named num [1:1000] 5.58 5.99 4.8 5.38 5.13 ...
## .. attr(*, "names")= chr [1:1000] "1" "2" "3" "4" ...
## $ sizes     : int [1:1000] 1 1 1 1 1 1 1 1 1 1 ...
## $ center    : num 5.04
## $ std.dev   : num 0.773
## $ nsigmas   : num 3
## $ limits    : num [1, 1:2] 2.72 7.36
## .. attr(*, "dimnames")=List of 2
## $ violations:List of 2
## - attr(*, "class")= chr "qcc"

# for normality Check scatter plot for trend. To ascertain that the data is
# free from seasonality
plot(x)
```



```
# check anderson darling value. If p is greater than 0.5, then normality is  
#confirmed.  
library(nortest)  
ad.test(x)  
  
##  
## Anderson-Darling normality test  
##  
## data: x  
## A = 1.5395, p-value = 0.0005768  
  
# needs normality plot ascertain with above runplot, scatter plot with AD  
value  
qqnorm(x)  
qqline(x)
```

## Normal Q-Q Plot



```
#Variance( Theoretical)  
(1/(.2*sqrt(40)))^2
```

```
## [1] 0.625
```

```
# Variance (actual)  
sd(x)^2
```

```
## [1] 0.6321408
```

```
#Mean( Calculated)= 5  
#Mean ( actual)  
mean(x)
```

```
## [1] 5.041605
```

```
#Conlusion:
```

```
# The mean and Sd can be compared sample with population. the normality  
# test = AD test and QQnorm plot are sensitive. The results depends on  
# random data. I have seen by running the code many times and getting diff p  
values
```