test

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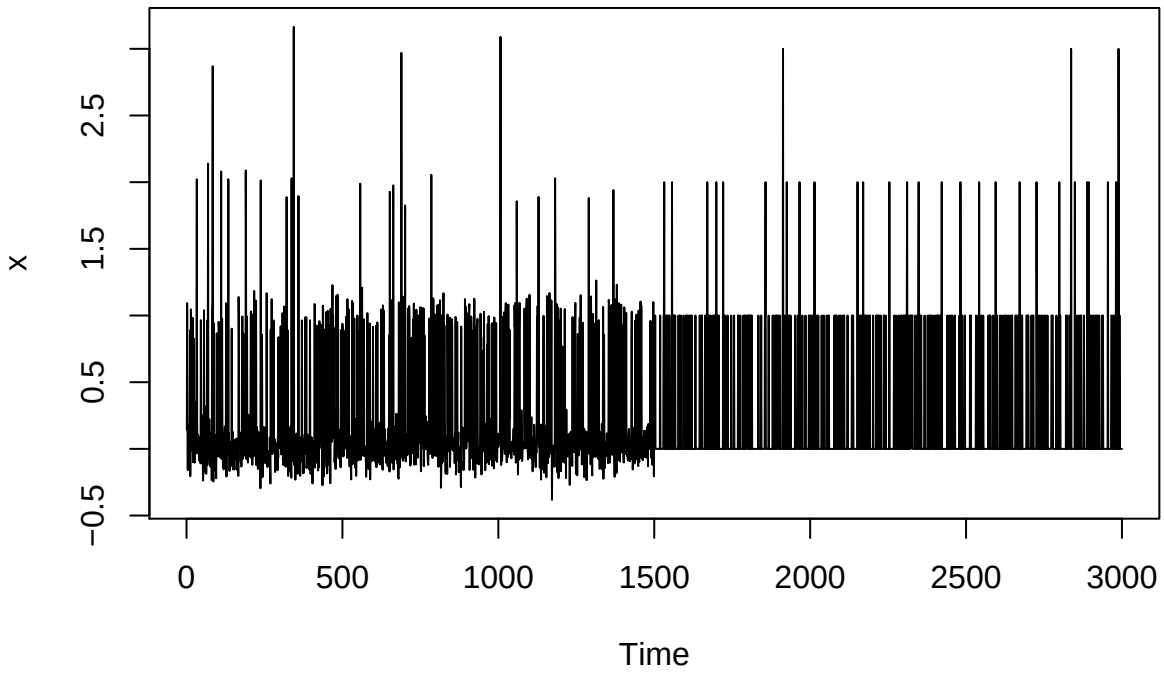
```
period <- 1500
sampleSize <- 2*period
c0=rpois(period,.2)
c1=rpois(period,.2)

noise = rnorm(period,0,.1)

c_notGrouded <- c0 + noise

series <- c(c_notGrouded,c1)
x <-ts(series)


plot(x)
```




```
mean(noise)
```

```
## [1] 0.001577716
```

```r
mean(c_notGrouded)
```

```
## [1] 0.1982444
```

```r
mean(c1)
```

```
## [1] 0.2213333
```

```r
mean(c0)
```

```
## [1] 0.1966667
```

```r
sum(c_notGrouded <0)
```

```
## [1] 581
```

```r
sum(c1<0)
```

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

```r
t.test(x = c_notGrouded,y = c1, alternative ="two.sided",var.equal = TRUE, conf.level = 0.01)
```

```
##
##  Two Sample t-test
##
## data:  c_notGrouded and c1
## t = -1.3637, df = 2998, p-value = 0.1728
## alternative hypothesis: true difference in means is not equal to 0
## 1 percent confidence interval:
##  -0.02330118 -0.02287672
## sample estimates:
## mean of x mean of y
## 0.1982444 0.2213333
```

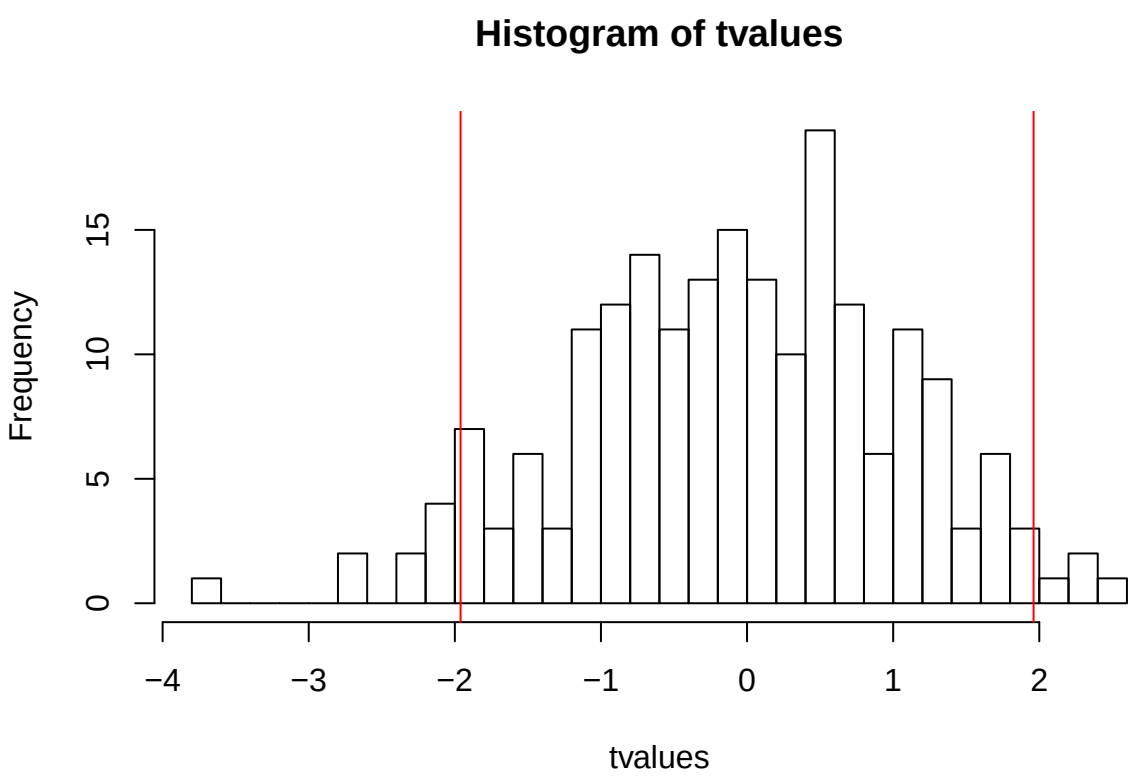
```r
var.test(x = c_notGrouded,y = c1, alternative ="two.sided")
```

```
##
##  F test to compare two variances
##
## data:  c_notGrouded and c1
## F = 0.93856, num df = 1499, denom df = 1499, p-value = 0.2198
## alternative hypothesis: true ratio of variances is not equal to 1
## 95 percent confidence interval:
##  0.8481577 1.0386066
## sample estimates:
## ratio of variances
##          0.9385639
```

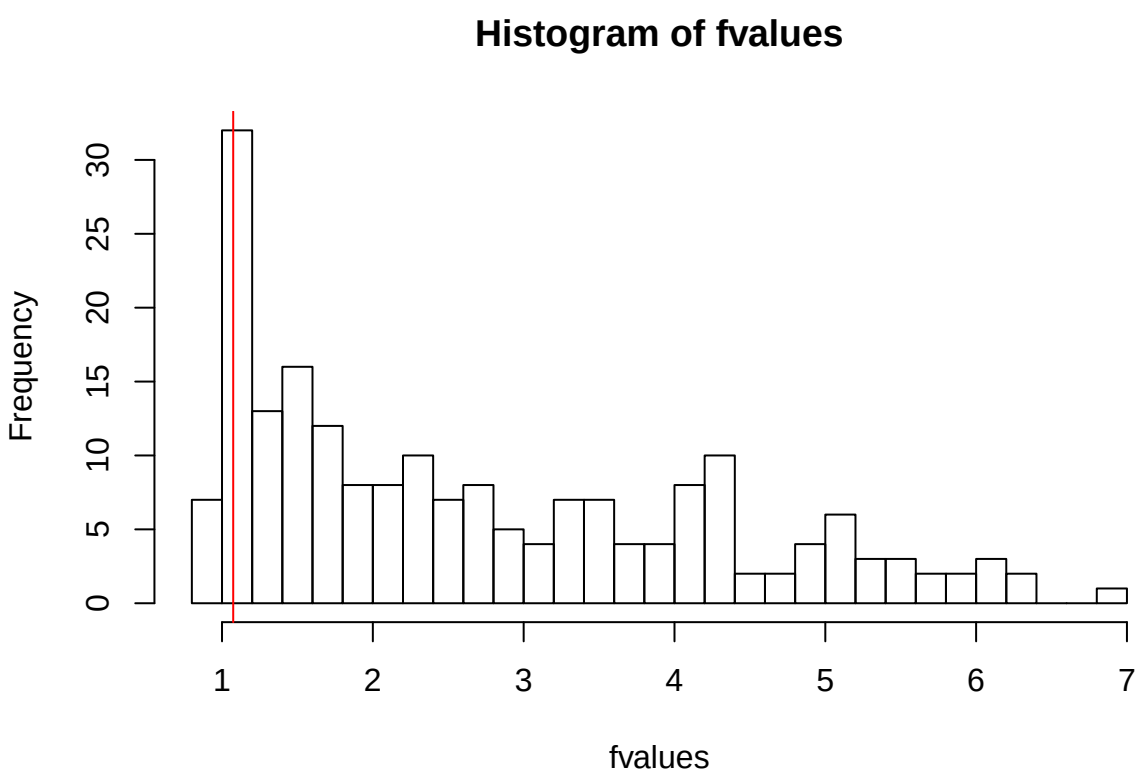
Look at many samples to get an idea of how a varying noise level may affect the

```r
simulationCount <- 200

tvalues <- matrix(0, nrow = simulationCount, ncol = 1)

fvalues <- matrix(0, nrow = simulationCount, ncol = 1)

noise.variances <- 1:simulationCount*( 1/simulationCount)
```

```
for (i in 1:simulationCount)
{
  c0=rpois(period,.2)
  c1=rpois(period,.2)

  noise = rnorm(period,0,noise.variances[i])

  c_notGrouded <- c0 + noise

  series <- c(c_notGrouded,c1)
  x <-ts(series)

  ttest.results <- t.test(x = c_notGrouded,y = c1, alternative ="two.sided",var.equal = TRUE, conf.level
  t.value <- ttest.results$statistic
  tvalues[i]<- t.value

  ftest.results <- var.test(x = c_notGrouded,y = c1, alternative ="two.sided")
  f.value <- ftest.results$statistic
  fvalues[i] <- f.value

}

alpha <- 0.05
talpha <- qt(1-alpha/2,df = sampleSize-1)

hist(tvalues,40)
abline(v=talpha, col='red')

abline(v=-talpha, col='red')
```




```
hist(fvalues,40)
falpha <- qf(1-alpha/2,df1 = sampleSize-1,df2 = sampleSize-1)
abline(v=falpha, col='red')
falpha <- qf(alpha/2,df1 = sampleSize-1,df2 = sampleSize-1)
abline(v=-falpha, col='red')
```


Histogram of fvalues
Frequency
0
5
10
15
20
25
30
1
2
3
4
5
6
7
fvalues