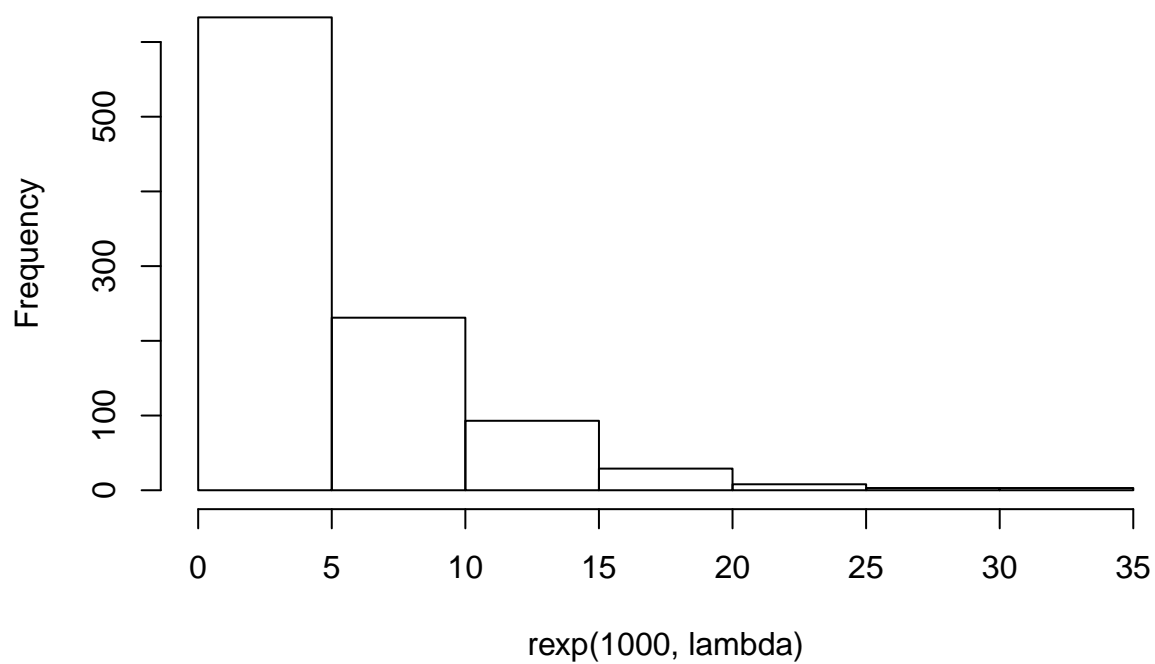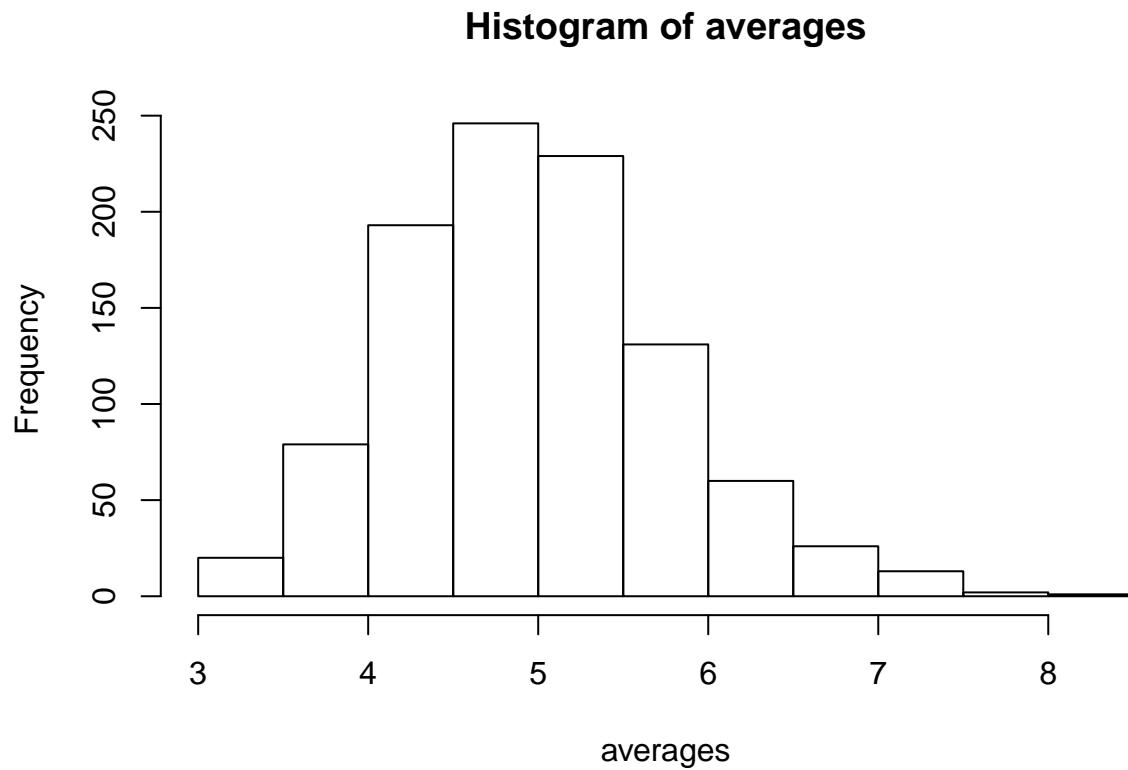# si_w4

Arturo Garcia

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```r
lambda <- 0.2

simulations <- matrix(rexp(40000,lambda), ncol = 40)

averages <- rowMeans(simulations)

sample_mean <- mean(averages)
sample_sd <- sd(averages)

hist(rexp(1000,lambda))
```

Histogram of rexp(1000, lambda)


```r
hist(averages)
```

Histogram of averages

Part 2

```
data(ToothGrowth)
?ToothGrowth
```

ToothGrowth {datasets}
The Effect of Vitamin C on Tooth Growth in Guinea Pigs

Description

The response is the length of odontoblasts (cells responsible for tooth growth) in 60 guinea pigs. Each animal received one of three dose levels of vitamin C (0.5, 1, and 2 mg/day) by one of two delivery methods, (orange juice or ascorbic acid (a form of vitamin C and coded as VC).

Usage

ToothGrowth Format

A data frame with 60 observations on 3 variables.

[,1] len numeric Tooth length
[,2] supp factor Supplement type (VC or OJ).
[,3] dose numeric Dose in milligrams/day

Source C. I. Bliss (1952) The Statistics of Bioassay. Academic Press.

```
with(ToothGrowth, t.test(len ~ supp))
```

```
## 
##   Welch Two Sample t-test
## 
## data:  len by supp
## t = 1.9153, df = 55.309, p-value = 0.06063
## alternative hypothesis: true difference in means is not equal to 0
## 95 percent confidence interval:
##  -0.1710156  7.5710156
## sample estimates:
## mean in group OJ mean in group VC
##          20.66333         16.96333
```

```r
head(ToothGrowth)
```

```
##     len supp dose
## 1  4.2   VC  0.5
## 2 11.5   VC  0.5
## 3  7.3   VC  0.5
## 4  5.8   VC  0.5
## 5  6.4   VC  0.5
## 6 10.0   VC  0.5
```

```r
str(ToothGrowth)
```

```
## 'data.frame':    60 obs. of  3 variables:
##  $ len : num  4.2 11.5 7.3 5.8 6.4 10 11.2 11.2 5.2 7 ...
##  $ supp: Factor w/ 2 levels "OJ","VC": 2 2 2 2 2 2 2 2 2 2 ...
##  $ dose: num  0.5 0.5 0.5 0.5 0.5 0.5 0.5 0.5 0.5 0.5 ...
```