Análisis y Tratamiento de Datos con R: Departamento de Matemática

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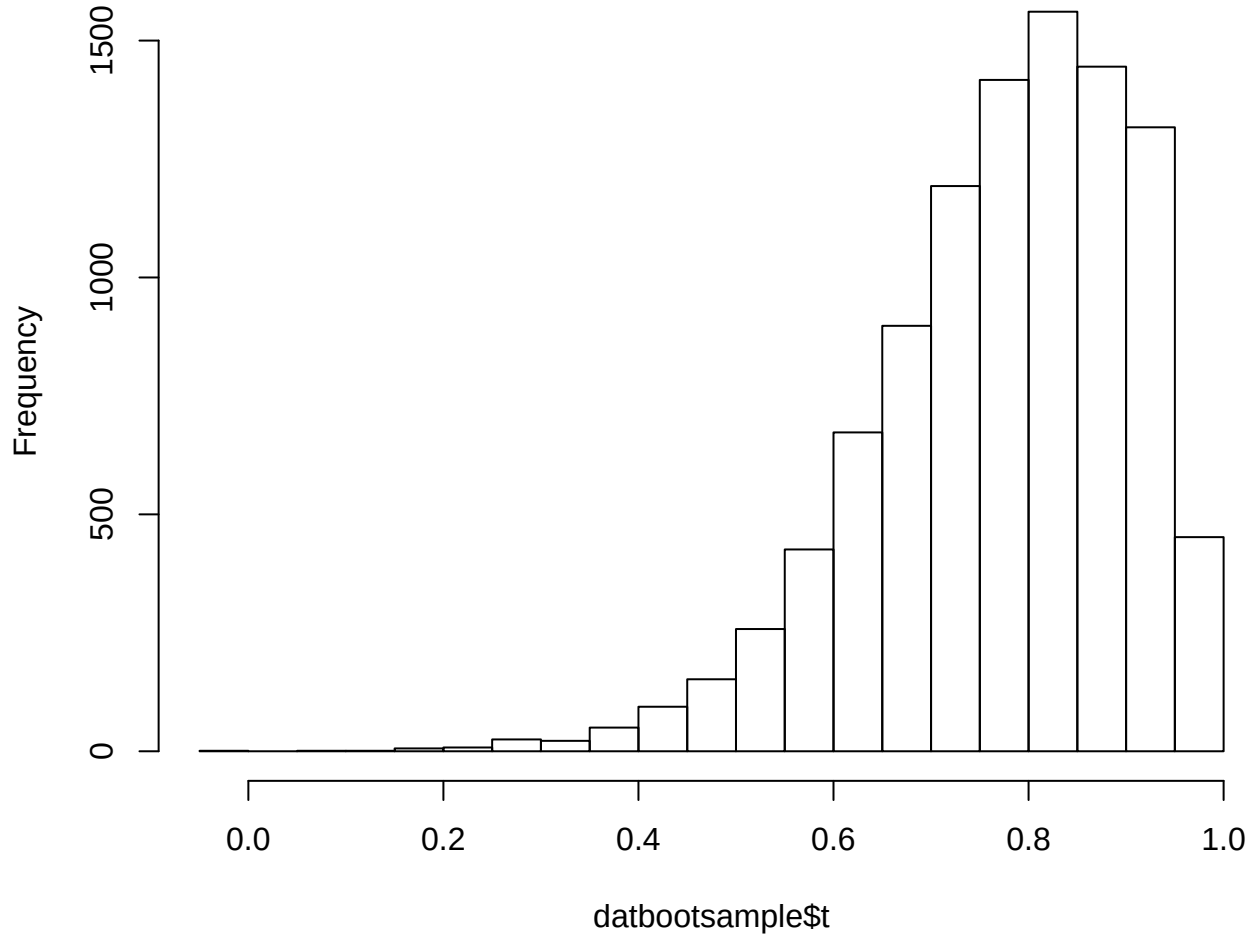
13 de noviembre de 2017

```
library(boot)

dat <- data.frame(school = 1:15,
                  LSAT = c(576,635,558,578,666,580,555,
                           661,651,605,653,575,545,
                           572,594),
                  GPA = c(3.39,3.30,2.81,3.03,3.44,
                          3.07,3.00,3.43,3.36,3.13,
                          3.12,2.74,2.76,2.88,2.96)
)

s <- function(df, indices){
  df <- df[indices,]
  return(with(df, cor(LSAT,GPA)))
}

B <- 10^4
datbootsample <- boot(data=dat , statistic=s , R=B)

hist(datbootsample$t)
```

*,




```
## método percentil
quantile(datbootsample$t, prob = c(.025,.975))
```

```
##      2.5%     97.5%
## 0.4679763 0.9618952
```

```
boot.ci(datbootsample,type = c("norm", "basic", "perc", "bca"))
```

```
## BOOTSTRAP CONFIDENCE INTERVAL CALCULATIONS
## Based on 10000 bootstrap replicates
##
## CALL :
## boot.ci(boot.out = datbootsample, type = c("norm", "basic", "perc",
##     "bca"))
##
## Intervals :
## Level      Normal              Basic
## 95%   ( 0.5209,  1.0387 )   ( 0.5907,  1.0848 )
##
## Level     Percentile            BCa
```

```
## 95%   ( 0.4679,  0.9620 )   ( 0.3000,  0.9390 )
## Calculations and Intervals on Original Scale
```

```
# Nonparametric confidence intervals for mean failure time
# of the air-conditioning data as in Example 5.4 of Davison
# and Hinkley (1997)
mean.fun <- function(d, i)
{    m <- mean(d$hours[i])
n <- length(i)
v <- (n-1)*var(d$hours[i])/n^2
c(m, v)
}
air.boot <- boot(aircondit, mean.fun, R = 999)
boot.ci(air.boot, type = c("norm", "basic", "perc", "stud"))
```

```
## BOOTSTRAP CONFIDENCE INTERVAL CALCULATIONS
## Based on 999 bootstrap replicates
##
## CALL :
## boot.ci(boot.out = air.boot, type = c("norm", "basic", "perc",
##     "stud"))
##
## Intervals :
## Level      Normal              Basic
## 95%   ( 33.3, 181.8 )   ( 28.3, 168.0 )
##
## Level    Studentized          Percentile
## 95%   ( 47.7, 298.1 )   ( 48.2, 187.8 )
## Calculations and Intervals on Original Scale
```

```
# Now using the log transformation
# There are two ways of doing this and they both give the
# same intervals.

# Method 1
boot.ci(air.boot, type = c("norm", "basic", "perc", "stud"),
        h = log, hdot = function(x) 1/x)
```

```
## BOOTSTRAP CONFIDENCE INTERVAL CALCULATIONS
## Based on 999 bootstrap replicates
##
## CALL :
## boot.ci(boot.out = air.boot, type = c("norm", "basic", "perc",
##     "stud"), h = log, hdot = function(x) 1/x)
##
## Intervals :
## Level      Normal              Basic
## 95%   ( 4.023,  5.460 )   ( 4.130,  5.491 )
##
## Level    Studentized          Percentile
## 95%   ( 3.974,  5.822 )   ( 3.875,  5.236 )
## Calculations and Intervals on  Transformed Scale
```

```r
# Method 2
vt0 <- air.boot$t0[2]/air.boot$t0[1]^2
vt <- air.boot$t[, 2]/air.boot$t[ ,1]^2
boot.ci(air.boot, type = c("norm", "basic", "perc", "stud"),
        t0 = log(air.boot$t0[1]), t = log(air.boot$t[,1]),
        var.t0 = vt0, var.t = vt)
```

```
## BOOTSTRAP CONFIDENCE INTERVAL CALCULATIONS
## Based on 999 bootstrap replicates
##
## CALL :
## boot.ci(boot.out = air.boot, type = c("norm", "basic", "perc",
##     "stud"), var.t0 = vt0, var.t = vt, t0 = log(air.boot$t0[1]),
##     t = log(air.boot$t[, 1]))
##
## Intervals :
## Level      Normal              Basic
## 95%   ( 4.059,  5.424 )   ( 4.130,  5.491 )
##
## Level    Studentized          Percentile
## 95%   ( 3.974,  5.822 )   ( 3.875,  5.236 )
## Calculations and Intervals on Original Scale
```