

Ejemplosbootstrap_II

Pedro Luque

Ejemplo 6

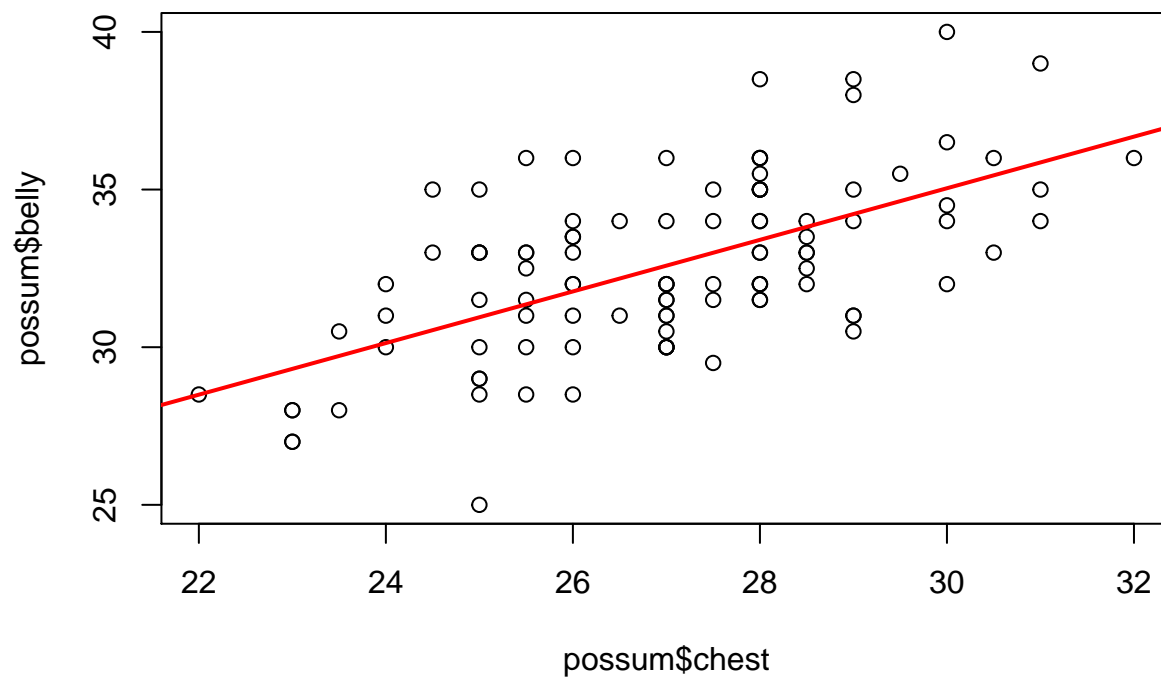
```
source("ananor.r")
#####
#Ejemplo 6. Coeficiente de correlac. lineal, transform. Z de Fisher
#Vamos a usar el paquete boot
#####
library(DAAG) #Para acceder a estos datos
```

```
## Loading required package: lattice
```

```
data(possum) #comadreja
?possum
z.transform = function(r) {.5*log((1+r)/(1-r))}
z.inversa = function(z) (exp(2*z)-1)/(exp(2*z)+1)
plot(possum$chest,possum$belly) #torso y barriga
cor(possum$chest,possum$belly)
```

```
## [1] 0.6061696
```

```
regre= lm(possum$belly~possum$chest)
abline(regre,col="red",lwd=2)
```



```
summary(regre)

##
## Call:
## lm(formula = possum$belly ~ possum$chest)
##
## Residuals:
##      Min       1Q   Median       3Q      Max
## -5.9496 -1.5865 -0.3819  1.6065  5.0950
##
## Coefficients:
##              Estimate Std. Error t value Pr(>|t|)
## (Intercept)   10.4885     2.8790   3.643 0.000426 ***
## possum$chest    0.8184     0.1063   7.697 9.19e-12 ***
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 2.207 on 102 degrees of freedom
## Multiple R-squared:  0.3674, Adjusted R-squared:  0.3612
## F-statistic: 59.25 on 1 and 102 DF,  p-value: 9.187e-12

library(boot)

##
## Attaching package: 'boot'

## The following object is masked from 'package:lattice':
##
##      melanoma

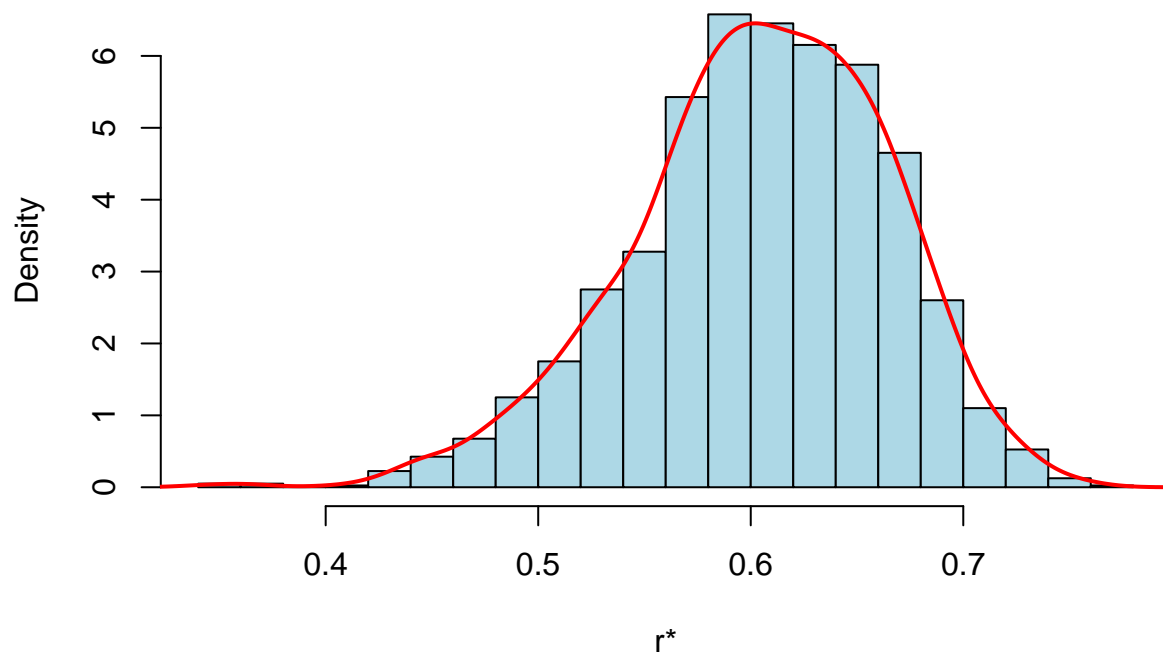
#Para usar este paquete, hay que definir una funcion que dependa
#de los indices para seleccionar elementos
#i1 e i2 son las posiciones de las dos variables cuyo coef.corr.
#se desea estudiar

cor.fun = function(datos,i1,i2, indices) {
  x = datos[indices,i1]
  y = datos[indices,i2]
  cor(x, y)} #r directamente

zcor.fun = function(datos,i1,i2, indices) {
  x = datos[indices,i1]
  y = datos[indices,i2]
  z.transform(cor(x, y))} #Con transf. Z de Fisher

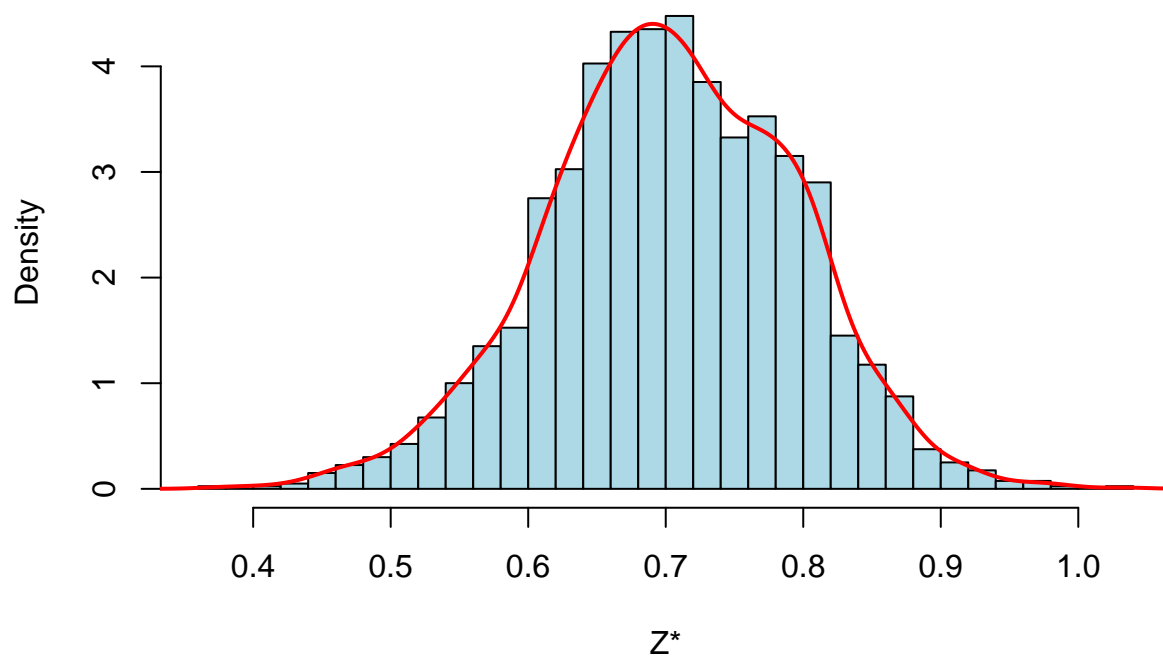
possum.boot1 = boot(possum, cor.fun, i1=13,i2=14, R=1999)
possum.boot2 = boot(possum, zcor.fun,i1=13,i2=14, R=1999)
hist(possum.boot1$t,prob=T,br=30,col="lightblue",
      main="Coef. correl. bootstrap",xlab="r*")
lines(density(possum.boot1$t,bw="SJ"),col="red",lwd=2)
```

Coef. correl. bootstrap



```
hist(possum.boot2$t,br=30,prob=T,col="lightblue",
     main="Transf. Z",xlab="Z*") #Más simétrica
lines(density(possum.boot2$t,bw="SJ"),col="red",lwd=2)
```

Transf. Z



```
#IC percentil, normal y BCa con transformac. inversa
z.inversa(boot.ci(possum.boot2, type="perc")$percent[4:5])
```

```
## [1] 0.4781624 0.7021606
z.inversa(boot.ci(possum.boot2, type="norm")$normal[2:3])

## [1] 0.4816745 0.7058855
z.inversa(boot.ci(possum.boot2, type="bca")$bca[4:5])

## [1] 0.4775746 0.7019402
#Sin aplicar la transformac.:
boot.ci(possum.boot1, type="perc")$percent[4:5]

## [1] 0.4755813 0.7087909
boot.ci(possum.boot2, type="norm")$normal[2:3]

## [1] 0.5251624 0.8789353
boot.ci(possum.boot2, type="bca")$bca[4:5]

## [1] 0.5198376 0.8711150
```