MEDIDAS

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R Markdown

#_____ MEDIDAS _____

Se trabajará con la matriz de datos "penguins.xlsx"

#1.- Exportacion de matriz

#Import dataset/from excel/ Browser/ seleccionar #archivo/ aceptar/ (visualizar)& import

#Librerias

```
library(readxl)
```

```
penguins<-read_excel("penguins.xlsx")
```

#2.- Acortar el nombre de la matriz de datos

```
BD<-penguins
```

Exploracion de la matriz

```
dim(BD)
```

```
## [1] 344   9
```

```
str(BD)
```

```
## tibble [344 x 9] (S3: tbl_df/tbl/data.frame)
##  $ ID             : chr [1:344] "i1" "i2" "i3" "i4" ...
##  $ especie        : chr [1:344] "Adelie" "Adelie" "Adelie" "Adelie" ...
##  $ isla           : chr [1:344] "Torgersen" "Torgersen" "Torgersen" "Torgersen" ...
##  $ largo_pico_mm  : num [1:344] 39.1 39.5 40.3 37.8 36.7 39.3 38.9 39.2 34.1 42 ...
##  $ grosor_pico_mm : num [1:344] 18.7 17.4 18 18.1 19.3 20.6 17.8 19.6 18.1 20.2 ...
##  $ largo_aleta_mm : num [1:344] 181 186 195 190 193 190 181 195 193 190 ...
##  $ masa_corporal_g: num [1:344] 3750 3800 3250 3700 3450 ...
##  $ genero         : chr [1:344] "male" "female" "female" "female" ...
##  $ año            : num [1:344] 2007 2007 2007 2007 2007 ...
```

```
colnames(BD)
```

```
## [1] "ID"              "especie"         "isla"            "largo_pico_mm"
## [5] "grosor_pico_mm"  "largo_aleta_mm"  "masa_corporal_g" "genero"
## [9] "año"
```

```
anyNA(BD)
```

```
## [1] FALSE
```

Tendencia central

1.- Media y mediana

```
summary(BD)
```

```
##       ID              especie              isla           largo_pico_mm
##  Length:344         Length:344         Length:344         Min.   :32.10
##  Class :character   Class :character   Class :character   1st Qu.:39.20
##  Mode  :character   Mode  :character   Mode  :character   Median :44.45
##                                                           Mean   :43.92
##                                                           3rd Qu.:48.50
##                                                           Max.   :59.60
##  grosor_pico_mm  largo_aleta_mm  masa_corporal_g    genero
##  Min.   :13.10   Min.   :172.0   Min.   :2700    Length:344
##  1st Qu.:15.60   1st Qu.:190.0   1st Qu.:3550    Class :character
##  Median :17.30   Median :197.0   Median :4050    Mode  :character
##  Mean   :17.15   Mean   :200.9   Mean   :4202
##  3rd Qu.:18.70   3rd Qu.:213.2   3rd Qu.:4756
##  Max.   :21.50   Max.   :231.0   Max.   :6300
##       año
##  Min.   :2007
##  1st Qu.:2007
##  Median :2008
##  Mean   :2008
##  3rd Qu.:2009
##  Max.   :2009
```

2.- Moda

2.1.- Se descarga el paquete “modeest”

```
install.packages("modeest")
```

```
## Installing package into '/cloud/lib/x86_64-pc-linux-gnu-library/4.2'
## (as 'lib' is unspecified)
```

2.2.- Se abre la librería

```
library(modeest)
```

2.3.- Cálculo de la moda para la variable isla y largo del pico

```
mfv(BD$especie) # categorica
```

```
## [1] "Adelie"
```

```
mfv(BD$largo_pico_mm) # numerica
```

```
## [1] 41.1
```

Medidas de dispersión

1.- Cálculo de la varianza (sólo para variables cuantitativas)

```
var(BD)
```

```
## Warning in var(BD): NAs introduced by coercion
```

```
##                 ID especie isla largo_pico_mm grosor_pico_mm largo_aleta_mm
## ID              NA      NA   NA            NA             NA             NA
## especie         NA      NA   NA            NA             NA             NA
## isla            NA      NA   NA            NA             NA             NA
## largo_pico_mm   NA      NA   NA     29.880437     -2.5614793      50.699587
## grosor_pico_mm  NA      NA   NA     -2.561479      3.8842565     -16.225494
## largo_aleta_mm  NA      NA   NA     50.699587    -16.2254941     198.221430
## masa_corporal_g NA      NA   NA   2612.853647   -746.8556131    9824.468820
## genero          NA      NA   NA            NA             NA             NA
## año             NA      NA   NA      0.279763     -0.1032155       2.030765
##                 masa_corporal_g genero        año
## ID                           NA     NA         NA
## especie                      NA     NA         NA
## isla                         NA     NA         NA
## largo_pico_mm        2612.85365     NA  0.2797630
## grosor_pico_mm       -746.85561     NA -0.1032155
## largo_aleta_mm       9824.46882     NA  2.0307648
## masa_corporal_g    641436.23614     NA 30.9109940
## genero                       NA     NA         NA
## año                    30.91099     NA  0.6697064
```

2.- Cálculo de la desviación estándar

```
sd(BD$grosor_pico_mm)
```

```
## [1] 1.970852
```

3.- Error

```
media_pico<-mean(BD$largo_pico_mm)
```

```
error<-(BD$largo_pico_mm-(media_pico))
```

```
error<-(BD$largo_pico_mm-(media_pico))
```

```
error
```

```
##   [1]  -4.82412791  -4.42412791  -3.62412791  -6.12412791  -7.22412791
##   [6]  -4.62412791  -5.02412791  -4.72412791  -9.82412791  -1.92412791
##  [11]  -6.12412791  -6.12412791  -2.82412791  -5.32412791  -9.32412791
##  [16]  -7.32412791  -5.22412791  -1.42412791  -9.52412791   2.07587209
##  [21]  -6.12412791  -6.22412791  -8.02412791  -5.72412791  -5.12412791
##  [26]  -8.62412791  -3.32412791  -3.42412791  -6.02412791  -3.42412791
##  [31]  -4.42412791  -6.72412791  -4.42412791  -3.02412791  -7.52412791
##  [36]  -4.72412791  -5.12412791  -1.72412791  -6.32412791  -4.12412791
##  [41]  -7.42412791  -3.12412791  -7.92412791   0.17587209  -6.92412791
##  [46]  -4.32412791  -2.82412791  -6.42412791  -7.92412791  -1.62412791
##  [51]  -4.32412791  -3.82412791  -8.92412791  -1.92412791  -9.42412791
##  [56]  -2.52412791  -4.92412791  -3.32412791  -7.42412791  -6.32412791
##  [61]  -8.22412791  -2.62412791  -6.32412791  -2.82412791  -7.52412791
##  [66]  -2.32412791  -8.42412791  -2.82412791  -8.02412791  -2.12412791
##  [71] -10.42412791  -4.22412791  -4.32412791   1.87587209  -8.42412791
##  [76]  -1.12412791  -3.02412791  -6.72412791  -7.72412791  -1.82412791
```

```
##  [81]  -9.32412791  -1.02412791  -7.22412791  -8.82412791  -6.62412791
##  [86]  -2.62412791  -7.62412791  -7.02412791  -5.62412791  -5.02412791
##  [91]  -8.22412791  -2.82412791  -9.92412791  -4.32412791  -7.72412791
##  [96]  -3.12412791  -5.82412791  -3.62412791 -10.82412791  -0.72412791
## [101]  -8.92412791  -2.92412791  -6.22412791  -6.12412791  -6.02412791
## [106]  -4.22412791  -5.32412791  -5.72412791  -5.82412791  -0.72412791
## [111]  -5.82412791   1.67587209  -4.22412791  -1.72412791  -4.32412791
## [116]  -1.22412791  -5.32412791  -6.62412791  -8.22412791  -2.82412791
## [121]  -7.72412791  -6.22412791  -3.72412791  -2.52412791  -8.72412791
## [126]  -3.32412791  -5.12412791  -2.42412791  -4.92412791   0.17587209
## [131]  -5.42412791  -0.82412791  -7.12412791  -6.42412791  -5.82412791
## [136]  -2.82412791  -8.32412791  -3.72412791  -6.92412791  -4.22412791
## [141]  -3.72412791  -3.32412791 -11.82412791  -3.22412791  -6.62412791
## [146]  -4.92412791  -4.72412791  -7.32412791  -7.92412791  -6.12412791
## [151]  -7.92412791  -2.42412791   2.17587209   6.07587209   4.77587209
## [156]   6.07587209   3.67587209   2.57587209   1.47587209   2.77587209
## [161]  -0.62412791   2.87587209  -3.02412791   5.07587209   1.57587209
## [166]   4.47587209   1.87587209   5.37587209  -1.92412791   5.27587209
## [171]   2.27587209   4.77587209   6.27587209   1.17587209   2.57587209
## [176]   2.37587209  -1.02412791   2.17587209   0.57587209   3.87587209
## [181]   4.27587209   6.07587209   3.37587209  -1.12412791   1.17587209
## [186]  15.67587209   5.17587209   4.47587209  -1.32412791   0.47587209
## [191]   0.07587209   4.77587209  -1.22412791   5.67587209   1.37587209
## [196]   5.67587209   6.57587209  -0.32412791   1.57587209   6.57587209
## [201]   0.97587209   1.27587209   2.67587209   4.57587209   1.17587209
## [206]   6.17587209   2.57587209   1.07587209  -0.12412791   1.57587209
## [211]  -0.72412791   6.47587209   1.37587209   2.27587209   1.77587209
## [216]  10.37587209   1.87587209   5.87587209   2.27587209   5.57587209
## [221]  -0.42412791   6.77587209   3.77587209   2.47587209   4.27587209
## [226]   2.57587209   2.47587209   4.67587209   3.57587209   7.17587209
## [231]   1.27587209   1.27587209   5.17587209   8.57587209   3.47587209
## [236]   6.07587209   0.97587209   6.87587209  -0.52412791   7.37587209
## [241]   3.57587209   8.17587209   3.57587209   8.27587209   1.57587209
## [246]   5.57587209   0.57587209   6.87587209   5.47587209   2.97587209
## [251]   4.47587209   7.17587209   4.57587209  11.97587209   3.27587209
## [256]   5.17587209   3.37587209   2.87587209  -2.22412791   9.47587209
## [261]  -0.62412791   4.17587209   6.57587209   5.87587209  -0.42412791
## [266]   7.57587209   2.27587209  11.17587209   0.57587209   4.87587209
## [271]   3.27587209   6.87587209   2.87587209   6.47587209   1.27587209
## [276]   5.97587209   2.57587209   6.07587209   7.37587209   1.47587209
## [281]   8.77587209   1.27587209   2.17587209   7.37587209   2.07587209
## [286]   7.37587209   2.67587209   7.77587209   3.07587209   8.07587209
## [291]   1.97587209   6.57587209   6.37587209  14.07587209   2.47587209
## [296]   5.27587209  -1.52412791   4.57587209  -0.72412791   6.67587209
## [301]   2.77587209   8.07587209   6.57587209   5.57587209   2.47587209
## [306]   8.87587209  -3.02412791  10.27587209  -1.42412791   7.07587209
## [311]   5.77587209   3.57587209   3.67587209   8.07587209   2.97587209
## [316]   9.57587209   5.07587209   2.27587209   6.97587209   1.57587209
## [321]   6.97587209   6.87587209   6.17587209   5.07587209   7.57587209
## [326]   5.87587209   4.17587209   7.47587209   1.77587209   6.77587209
## [331]  -1.42412791   8.27587209   1.27587209   5.37587209   6.27587209
## [336]   1.67587209   7.97587209   2.87587209   1.77587209  11.87587209
## [341]  -0.42412791   5.67587209   6.87587209   6.27587209
```

4.- Coeficiente de variacion

```
CV<- sd(BD$largo_pico_mm)/mean(BD$largo_pico_mm)*100
```

```
CV
```

```
## [1] 12.44487
```

5.- Rango intercuartilico (IQR)

```
IQR(BD$largo_pico_mm)
```

```
## [1] 9.3
```

6.- Rango

```
pico<-BD$largo_pico_mm
```

```
pico
```

```
##   [1] 39.1 39.5 40.3 37.8 36.7 39.3 38.9 39.2 34.1 42.0 37.8 37.8 41.1 38.6 34.6
##  [16] 36.6 38.7 42.5 34.4 46.0 37.8 37.7 35.9 38.2 38.8 35.3 40.6 40.5 37.9 40.5
##  [31] 39.5 37.2 39.5 40.9 36.4 39.2 38.8 42.2 37.6 39.8 36.5 40.8 36.0 44.1 37.0
##  [46] 39.6 41.1 37.5 36.0 42.3 39.6 40.1 35.0 42.0 34.5 41.4 39.0 40.6 36.5 37.6
##  [61] 35.7 41.3 37.6 41.1 36.4 41.6 35.5 41.1 35.9 41.8 33.5 39.7 39.6 45.8 35.5
##  [76] 42.8 40.9 37.2 36.2 42.1 34.6 42.9 36.7 35.1 37.3 41.3 36.3 36.9 38.3 38.9
##  [91] 35.7 41.1 34.0 39.6 36.2 40.8 38.1 40.3 33.1 43.2 35.0 41.0 37.7 37.8 37.9
## [106] 39.7 38.6 38.2 38.1 43.2 38.1 45.6 39.7 42.2 39.6 42.7 38.6 37.3 35.7 41.1
## [121] 36.2 37.7 40.2 41.4 35.2 40.6 38.8 41.5 39.0 44.1 38.5 43.1 36.8 37.5 38.1
## [136] 41.1 35.6 40.2 37.0 39.7 40.2 40.6 32.1 40.7 37.3 39.0 39.2 36.6 36.0 37.8
## [151] 36.0 41.5 46.1 50.0 48.7 50.0 47.6 46.5 45.4 46.7 43.3 46.8 40.9 49.0 45.5
## [166] 48.4 45.8 49.3 42.0 49.2 46.2 48.7 50.2 45.1 46.5 46.3 42.9 46.1 44.5 47.8
## [181] 48.2 50.0 47.3 42.8 45.1 59.6 49.1 48.4 42.6 44.4 44.0 48.7 42.7 49.6 45.3
## [196] 49.6 50.5 43.6 45.5 50.5 44.9 45.2 46.6 48.5 45.1 50.1 46.5 45.0 43.8 45.5
## [211] 43.2 50.4 45.3 46.2 45.7 54.3 45.8 49.8 46.2 49.5 43.5 50.7 47.7 46.4 48.2
## [226] 46.5 46.4 48.6 47.5 51.1 45.2 45.2 49.1 52.5 47.4 50.0 44.9 50.8 43.4 51.3
## [241] 47.5 52.1 47.5 52.2 45.5 49.5 44.5 50.8 49.4 46.9 48.4 51.1 48.5 55.9 47.2
## [256] 49.1 47.3 46.8 41.7 53.4 43.3 48.1 50.5 49.8 43.5 51.5 46.2 55.1 44.5 48.8
## [271] 47.2 50.8 46.8 50.4 45.2 49.9 46.5 50.0 51.3 45.4 52.7 45.2 46.1 51.3 46.0
## [286] 51.3 46.6 51.7 47.0 52.0 45.9 50.5 50.3 58.0 46.4 49.2 42.4 48.5 43.2 50.6
## [301] 46.7 52.0 50.5 49.5 46.4 52.8 40.9 54.2 42.5 51.0 49.7 47.5 47.6 52.0 46.9
## [316] 53.5 49.0 46.2 50.9 45.5 50.9 50.8 50.1 49.0 51.5 49.8 48.1 51.4 45.7 50.7
## [331] 42.5 52.2 45.2 49.3 50.2 45.6 51.9 46.8 45.7 55.8 43.5 49.6 50.8 50.2
```

```
max(pico)
```

```
## [1] 59.6
```

```
min(pico)
```

```
## [1] 32.1
```

```
rango<-max(pico)-min(pico)
```

```
rango
```

```
## [1] 27.5
```

Medidas de posición

1.- Cuartiles

```
summary(BD)
```

```
##       ID              especie              isla           largo_pico_mm
##  Length:344         Length:344         Length:344         Min.   :32.10
##  Class :character   Class :character   Class :character   1st Qu.:39.20
##  Mode  :character   Mode  :character   Mode  :character   Median :44.45
##                                                           Mean   :43.92
##                                                           3rd Qu.:48.50
##                                                           Max.   :59.60
##  grosor_pico_mm  largo_aleta_mm  masa_corporal_g    genero
##  Min.   :13.10   Min.   :172.0   Min.   :2700    Length:344
##  1st Qu.:15.60   1st Qu.:190.0   1st Qu.:3550    Class :character
##  Median :17.30   Median :197.0   Median :4050    Mode  :character
##  Mean   :17.15   Mean   :200.9   Mean   :4202
##  3rd Qu.:18.70   3rd Qu.:213.2   3rd Qu.:4756
##  Max.   :21.50   Max.   :231.0   Max.   :6300
##       año
##  Min.   :2007
##  1st Qu.:2007
##  Median :2008
##  Mean   :2008
##  3rd Qu.:2009
##  Max.   :2009
```

2.- Quintil

```
quintil<-quantile(BD[["largo_aleta_mm"]],
                  p=c(.20, .40, .60, .80))
```

```
quintil
```

```
## 20% 40% 60% 80%
## 188 194 203 215
```

3.- Decil

```
decil<-quantile(BD[["largo_aleta_mm"]],
                p=c(.10, .20, .30, .40, .50, .60,
                    .70, .80, .90))
```

```
decil
```

```
## 10% 20% 30% 40% 50% 60% 70% 80% 90%
## 185 188 191 194 197 203 210 215 221
```

Percentil

```
percentil<-quantile(BD[["largo_aleta_mm"]],
                    p=c(.33, .66, .99))
```

```
percentil
```

```
## 33% 66% 99%
## 192 209 230
```

Interpretacion:

<192 = Bajo 192-209 = Intermedio > 209 = Alto

Ejercicio 1

1.- Media y mediana

```
summary(BD)
```

```
##       ID              especie              isla           largo_pico_mm
##  Length:344         Length:344         Length:344         Min.   :32.10
##  Class :character   Class :character   Class :character   1st Qu.:39.20
##  Mode  :character   Mode  :character   Mode  :character   Median :44.45
##                                                           Mean   :43.92
##                                                           3rd Qu.:48.50
##                                                           Max.   :59.60
##  grosor_pico_mm  largo_aleta_mm  masa_corporal_g    genero
##  Min.   :13.10   Min.   :172.0   Min.   :2700    Length:344
##  1st Qu.:15.60   1st Qu.:190.0   1st Qu.:3550    Class :character
##  Median :17.30   Median :197.0   Median :4050    Mode  :character
##  Mean   :17.15   Mean   :200.9   Mean   :4202
##  3rd Qu.:18.70   3rd Qu.:213.2   3rd Qu.:4756
##  Max.   :21.50   Max.   :231.0   Max.   :6300
##       año
##  Min.   :2007
##  1st Qu.:2007
##  Median :2008
##  Mean   :2008
##  3rd Qu.:2009
##  Max.   :2009
```

2.- Moda

2.1.- Se descarga el paquete “modeest”

```
install.packages("modeest")
```

```
## Installing package into '/cloud/lib/x86_64-pc-linux-gnu-library/4.2'
## (as 'lib' is unspecified)
```

2.2.- Se abre la librería

```
library(modeest)
```

2.3.- Cálculo de la moda para la variable isla y largo del pico

```
mfv(BD$especie) # categorica
```

```
## [1] "Adelie"
```

```
mfv(BD$largo_pico_mm) # numerica
```

```
## [1] 41.1
```

Medidas de dispersión

1.- Cálculo de la varianza (sólo para variables cuantitativas)

```
var(BD$largo_pico_mm)
```

```
## [1] 29.88044
```

2.- Cálculo de la desviación estándar

```
sd(BD$largo_pico_mm)
```

```
## [1] 5.4663
```

3.- Error

```
media_pico<-mean(BD$largo_pico_mm)
```

```
error<-(BD$largo_pico_mm-(media_pico))
```

```
error
```

```
##   [1]  -4.82412791  -4.42412791  -3.62412791  -6.12412791  -7.22412791
##   [6]  -4.62412791  -5.02412791  -4.72412791  -9.82412791  -1.92412791
##  [11]  -6.12412791  -6.12412791  -2.82412791  -5.32412791  -9.32412791
##  [16]  -7.32412791  -5.22412791  -1.42412791  -9.52412791   2.07587209
##  [21]  -6.12412791  -6.22412791  -8.02412791  -5.72412791  -5.12412791
##  [26]  -8.62412791  -3.32412791  -3.42412791  -6.02412791  -3.42412791
##  [31]  -4.42412791  -6.72412791  -4.42412791  -3.02412791  -7.52412791
##  [36]  -4.72412791  -5.12412791  -1.72412791  -6.32412791  -4.12412791
##  [41]  -7.42412791  -3.12412791  -7.92412791   0.17587209  -6.92412791
##  [46]  -4.32412791  -2.82412791  -6.42412791  -7.92412791  -1.62412791
##  [51]  -4.32412791  -3.82412791  -8.92412791  -1.92412791  -9.42412791
##  [56]  -2.52412791  -4.92412791  -3.32412791  -7.42412791  -6.32412791
##  [61]  -8.22412791  -2.62412791  -6.32412791  -2.82412791  -7.52412791
##  [66]  -2.32412791  -8.42412791  -2.82412791  -8.02412791  -2.12412791
##  [71] -10.42412791  -4.22412791  -4.32412791   1.87587209  -8.42412791
##  [76]  -1.12412791  -3.02412791  -6.72412791  -7.72412791  -1.82412791
##  [81]  -9.32412791  -1.02412791  -7.22412791  -8.82412791  -6.62412791
##  [86]  -2.62412791  -7.62412791  -7.02412791  -5.62412791  -5.02412791
##  [91]  -8.22412791  -2.82412791  -9.92412791  -4.32412791  -7.72412791
##  [96]  -3.12412791  -5.82412791  -3.62412791 -10.82412791  -0.72412791
## [101]  -8.92412791  -2.92412791  -6.22412791  -6.12412791  -6.02412791
## [106]  -4.22412791  -5.32412791  -5.72412791  -5.82412791  -0.72412791
## [111]  -5.82412791   1.67587209  -4.22412791  -1.72412791  -4.32412791
## [116]  -1.22412791  -5.32412791  -6.62412791  -8.22412791  -2.82412791
## [121]  -7.72412791  -6.22412791  -3.72412791  -2.52412791  -8.72412791
## [126]  -3.32412791  -5.12412791  -2.42412791  -4.92412791   0.17587209
## [131]  -5.42412791  -0.82412791  -7.12412791  -6.42412791  -5.82412791
## [136]  -2.82412791  -8.32412791  -3.72412791  -6.92412791  -4.22412791
## [141]  -3.72412791  -3.32412791 -11.82412791  -3.22412791  -6.62412791
## [146]  -4.92412791  -4.72412791  -7.32412791  -7.92412791  -6.12412791
## [151]  -7.92412791  -2.42412791   2.17587209   6.07587209   4.77587209
## [156]   6.07587209   3.67587209   2.57587209   1.47587209   2.77587209
## [161]  -0.62412791   2.87587209  -3.02412791   5.07587209   1.57587209
## [166]   4.47587209   1.87587209   5.37587209  -1.92412791   5.27587209
## [171]   2.27587209   4.77587209   6.27587209   1.17587209   2.57587209
## [176]   2.37587209  -1.02412791   2.17587209   0.57587209   3.87587209
## [181]   4.27587209   6.07587209   3.37587209  -1.12412791   1.17587209
## [186]  15.67587209   5.17587209   4.47587209  -1.32412791   0.47587209
```

```
## [191]   0.07587209   4.77587209  -1.22412791   5.67587209   1.37587209
## [196]   5.67587209   6.57587209  -0.32412791   1.57587209   6.57587209
## [201]   0.97587209   1.27587209   2.67587209   4.57587209   1.17587209
## [206]   6.17587209   2.57587209   1.07587209  -0.12412791   1.57587209
## [211]  -0.72412791   6.47587209   1.37587209   2.27587209   1.77587209
## [216]  10.37587209   1.87587209   5.87587209   2.27587209   5.57587209
## [221]  -0.42412791   6.77587209   3.77587209   2.47587209   4.27587209
## [226]   2.57587209   2.47587209   4.67587209   3.57587209   7.17587209
## [231]   1.27587209   1.27587209   5.17587209   8.57587209   3.47587209
## [236]   6.07587209   0.97587209   6.87587209  -0.52412791   7.37587209
## [241]   3.57587209   8.17587209   3.57587209   8.27587209   1.57587209
## [246]   5.57587209   0.57587209   6.87587209   5.47587209   2.97587209
## [251]   4.47587209   7.17587209   4.57587209  11.97587209   3.27587209
## [256]   5.17587209   3.37587209   2.87587209  -2.22412791   9.47587209
## [261]  -0.62412791   4.17587209   6.57587209   5.87587209  -0.42412791
## [266]   7.57587209   2.27587209  11.17587209   0.57587209   4.87587209
## [271]   3.27587209   6.87587209   2.87587209   6.47587209   1.27587209
## [276]   5.97587209   2.57587209   6.07587209   7.37587209   1.47587209
## [281]   8.77587209   1.27587209   2.17587209   7.37587209   2.07587209
## [286]   7.37587209   2.67587209   7.77587209   3.07587209   8.07587209
## [291]   1.97587209   6.57587209   6.37587209  14.07587209   2.47587209
## [296]   5.27587209  -1.52412791   4.57587209  -0.72412791   6.67587209
## [301]   2.77587209   8.07587209   6.57587209   5.57587209   2.47587209
## [306]   8.87587209  -3.02412791  10.27587209  -1.42412791   7.07587209
## [311]   5.77587209   3.57587209   3.67587209   8.07587209   2.97587209
## [316]   9.57587209   5.07587209   2.27587209   6.97587209   1.57587209
## [321]   6.97587209   6.87587209   6.17587209   5.07587209   7.57587209
## [326]   5.87587209   4.17587209   7.47587209   1.77587209   6.77587209
## [331]  -1.42412791   8.27587209   1.27587209   5.37587209   6.27587209
## [336]   1.67587209   7.97587209   2.87587209   1.77587209  11.87587209
## [341]  -0.42412791   5.67587209   6.87587209   6.27587209
```

4.- Coeficiente de variacion

```
CV<- sd(BD$largo_pico_mm)/mean(BD$largo_pico_mm)*100
```

```
CV
```

```
## [1] 12.44487
```

5.- Rango intercuartilico (IQR)

```
IQR(BD$largo_pico_mm)
```

```
## [1] 9.3
```

6.- Rango

```
pico<-BD$largo_pico_mm
```

```
pico
```

```
##   [1] 39.1 39.5 40.3 37.8 36.7 39.3 38.9 39.2 34.1 42.0 37.8 37.8 41.1 38.6 34.6
##  [16] 36.6 38.7 42.5 34.4 46.0 37.8 37.7 35.9 38.2 38.8 35.3 40.6 40.5 37.9 40.5
##  [31] 39.5 37.2 39.5 40.9 36.4 39.2 38.8 42.2 37.6 39.8 36.5 40.8 36.0 44.1 37.0
##  [46] 39.6 41.1 37.5 36.0 42.3 39.6 40.1 35.0 42.0 34.5 41.4 39.0 40.6 36.5 37.6
##  [61] 35.7 41.3 37.6 41.1 36.4 41.6 35.5 41.1 35.9 41.8 33.5 39.7 39.6 45.8 35.5
##  [76] 42.8 40.9 37.2 36.2 42.1 34.6 42.9 36.7 35.1 37.3 41.3 36.3 36.9 38.3 38.9
```

```
##  [91] 35.7 41.1 34.0 39.6 36.2 40.8 38.1 40.3 33.1 43.2 35.0 41.0 37.7 37.8 37.9
## [106] 39.7 38.6 38.2 38.1 43.2 38.1 45.6 39.7 42.2 39.6 42.7 38.6 37.3 35.7 41.1
## [121] 36.2 37.7 40.2 41.4 35.2 40.6 38.8 41.5 39.0 44.1 38.5 43.1 36.8 37.5 38.1
## [136] 41.1 35.6 40.2 37.0 39.7 40.2 40.6 32.1 40.7 37.3 39.0 39.2 36.6 36.0 37.8
## [151] 36.0 41.5 46.1 50.0 48.7 50.0 47.6 46.5 45.4 46.7 43.3 46.8 40.9 49.0 45.5
## [166] 48.4 45.8 49.3 42.0 49.2 46.2 48.7 50.2 45.1 46.5 46.3 42.9 46.1 44.5 47.8
## [181] 48.2 50.0 47.3 42.8 45.1 59.6 49.1 48.4 42.6 44.4 44.0 48.7 42.7 49.6 45.3
## [196] 49.6 50.5 43.6 45.5 50.5 44.9 45.2 46.6 48.5 45.1 50.1 46.5 45.0 43.8 45.5
## [211] 43.2 50.4 45.3 46.2 45.7 54.3 45.8 49.8 46.2 49.5 43.5 50.7 47.7 46.4 48.2
## [226] 46.5 46.4 48.6 47.5 51.1 45.2 45.2 49.1 52.5 47.4 50.0 44.9 50.8 43.4 51.3
## [241] 47.5 52.1 47.5 52.2 45.5 49.5 44.5 50.8 49.4 46.9 48.4 51.1 48.5 55.9 47.2
## [256] 49.1 47.3 46.8 41.7 53.4 43.3 48.1 50.5 49.8 43.5 51.5 46.2 55.1 44.5 48.8
## [271] 47.2 50.8 46.8 50.4 45.2 49.9 46.5 50.0 51.3 45.4 52.7 45.2 46.1 51.3 46.0
## [286] 51.3 46.6 51.7 47.0 52.0 45.9 50.5 50.3 58.0 46.4 49.2 42.4 48.5 43.2 50.6
## [301] 46.7 52.0 50.5 49.5 46.4 52.8 40.9 54.2 42.5 51.0 49.7 47.5 47.6 52.0 46.9
## [316] 53.5 49.0 46.2 50.9 45.5 50.9 50.8 50.1 49.0 51.5 49.8 48.1 51.4 45.7 50.7
## [331] 42.5 52.2 45.2 49.3 50.2 45.6 51.9 46.8 45.7 55.8 43.5 49.6 50.8 50.2
```

```
max(pico)
```

```
## [1] 59.6
```

```
min(pico)
```

```
## [1] 32.1
```

```
rango<-max(pico)-min(pico)
```

```
rango
```

```
## [1] 27.5
```

Medidas de posición

1.- Cuartiles

```
summary(BD)
```

```
##       ID              especie              isla           largo_pico_mm
##  Length:344         Length:344         Length:344         Min.   :32.10
##  Class :character   Class :character   Class :character   1st Qu.:39.20
##  Mode  :character   Mode  :character   Mode  :character   Median :44.45
##                                                           Mean   :43.92
##                                                           3rd Qu.:48.50
##                                                           Max.   :59.60
##  grosor_pico_mm  largo_aleta_mm  masa_corporal_g    genero
##  Min.   :13.10   Min.   :172.0   Min.   :2700    Length:344
##  1st Qu.:15.60   1st Qu.:190.0   1st Qu.:3550    Class :character
##  Median :17.30   Median :197.0   Median :4050    Mode  :character
##  Mean   :17.15   Mean   :200.9   Mean   :4202
##  3rd Qu.:18.70   3rd Qu.:213.2   3rd Qu.:4756
##  Max.   :21.50   Max.   :231.0   Max.   :6300
##       año
##  Min.   :2007
##  1st Qu.:2007
##  Median :2008
##  Mean   :2008
```

```
##  3rd Qu.:2009
##  Max.   :2009
```

2.- Quintil

```
quintil<-quantile(BD[["largo_pico_mm"]],
                  p=c(.20, .40, .60, .80))
```

```
quintil
```

```
##   20%   40%   60%   80%
## 38.26 42.00 46.00 49.44
```

3.- Decil

```
decil<-quantile(BD[["largo_pico_mm"]],
                p=c(.10, .20, .30, .40, .50, .60,
                    .70, .80, .90))
```

```
decil
```

```
##   10%   20%   30%   40%   50%   60%   70%   80%   90%
## 36.60 38.26 40.20 42.00 44.45 46.00 47.41 49.44 50.80
```

Percentil

```
percentil<-quantile(BD[["largo_pico_mm"]],
                    p=c(.33, .66, .99))
```

```
percentil
```

```
##    33%    66%    99%
## 40.719 46.638 55.499
```

Interpretacion:

<192 = Bajo 192-209 = Intermedio > 209 = Alto