MEDIDAS

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_____ MEDIDAS _____ se trabajará con la matriz de datos "penguins1.xlsx"

```
library(readxl)
```

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

Tendencia central

1.- Medios y medianas

```
summary(penguins)
```

```
##       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(penguins$isla)
```

```
## [1] "Biscoe"
```

```
mfv(penguins$largo_pico_mm)
```

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

Medidas de dispersión

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

```
var(penguins$grosor_pico_mm)
```

```
## [1] 3.884256
```

2.- Cálculo de la desviación estándar

```
sd(penguins$grosor_pico_mm)
```

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

3.- Error

```
media_pico<-mean(penguins$largo_pico_mm)
error<-(penguins$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 variación

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

```
CV
```

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

5.- Rango intercuartilico (IQR)

```
IQR(penguins$largo_pico_mm)
```

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

6.- Rango

```
pico<-penguins$largo_pico_mm
rango<-max(pico)-min(pico)
rango
```

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

Medidas de posición

1.- Cuartiles

```
summary(penguins)
```

```
##       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(penguins[["largo_aleta_mm"]],
                  p=c(.20, .40, .60, .80))
```

```
quintil
```

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

3.- Decil

```
decil<-quantile(penguins[["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

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

```r
percentil
```

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

Interpretacion: <192 = Bajo 192-209 = Intermedio 209 = Alto 1.- Media y mediana

```r
summary(penguins)
```

```
##       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

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

```r
mfv(penguins$genero)
```

```
## [1] "female"
```

```r
mfv(penguins$grosor_pico_mm)
```

```
## [1] 17
```

Medidas de dispersión

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

```r
var(penguins$grosor_pico_mm)
```

```
## [1] 3.884256
```

2.- Cálculo de la desviación estándar

```r
sd(penguins$grosor_pico_mm)
```

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

3.- Error

```
media_pico<-mean(penguins$grosor_pico_mm)
error<-(penguins$grosor_pico_mm-(media_pico))
error
```

```
##   [1]  1.5497093  0.2497093  0.8497093  0.9497093  2.1497093  3.4497093
##   [7]  0.6497093  2.4497093  0.9497093  3.0497093 -0.0502907  0.1497093
##  [13]  0.4497093  4.0497093  3.9497093  0.6497093  1.8497093  3.5497093
##  [19]  1.2497093  4.3497093  1.1497093  1.5497093  2.0497093  0.9497093
##  [25]  0.0497093  1.7497093  1.4497093  0.7497093  1.4497093  1.7497093
##  [31] -0.4502907  0.9497093  0.6497093  1.7497093 -0.1502907  3.9497093
##  [37]  2.8497093  1.3497093  2.1497093  1.9497093  0.8497093  1.2497093
##  [43]  1.3497093  2.5497093 -0.2502907  1.6497093  1.8497093  1.7497093
##  [49]  0.7497093  4.0497093  0.5497093  1.7497093  0.7497093  2.3497093
##  [55]  0.9497093  1.4497093  0.3497093  1.6497093 -0.5502907  1.9497093
##  [61] -0.2502907  3.9497093 -0.1502907  1.0497093 -0.0502907  0.8497093
##  [67] -0.9502907  1.9497093 -0.5502907  2.2497093  1.8497093  1.2497093
##  [73]  0.0497093  1.7497093  0.3497093  1.3497093 -0.3502907  2.2497093
##  [79] -1.0502907  1.9497093  0.0497093  0.4497093  1.6497093  2.2497093
##  [85]  0.6497093  3.1497093  2.3497093  1.4497093  2.0497093  1.6497093
##  [91]  0.8497093  0.9497093 -0.0502907  0.9497093  0.1497093  1.7497093
##  [97]  1.4497093  1.3497093 -1.0502907  1.3497093  0.7497093  2.8497093
## [103] -1.1502907  2.8497093  1.4497093  1.7497093  0.0497093  2.8497093
## [109] -0.1502907  1.8497093 -0.6502907  3.1497093  0.5497093  2.3497093
## [115]  3.5497093  1.1497093 -0.1502907  3.3497093 -0.1502907  1.4497093
## [121]  0.0497093  2.6497093 -0.1502907  1.3497093 -1.2502907  1.8497093
## [127]  0.4497093  1.1497093 -0.0502907  0.8497093  0.7497093  2.0497093
## [133]  1.3497093  1.3497093  0.4497093  0.3497093  0.3497093  2.9497093
## [139] -0.6502907  0.7497093 -0.0502907  0.0497093 -1.6502907 -0.1502907
## [145] -0.3502907  1.5497093  1.4497093  1.2497093  0.6497093  0.9497093
## [151] -0.0502907  1.3497093 -3.9502907 -0.8502907 -3.0502907 -1.9502907
## [157] -2.6502907 -3.6502907 -2.5502907 -1.8502907 -3.7502907 -1.7502907
## [163] -3.4502907 -1.0502907 -3.4502907 -2.5502907 -2.5502907 -1.4502907
## [169] -3.6502907 -1.9502907 -2.6502907 -2.0502907 -2.8502907 -2.6502907
## [175] -2.6502907 -1.3502907 -4.0502907 -2.0502907 -2.8502907 -2.1502907
## [181] -2.8502907 -1.8502907 -1.8502907 -2.9502907 -2.6502907 -0.1502907
## [187] -2.3502907 -0.8502907 -3.4502907  0.1497093 -3.5502907 -1.4502907
## [193] -3.4502907 -1.1502907 -3.4502907 -2.1502907 -1.2502907 -3.2502907
## [199] -3.2502907 -1.2502907 -3.8502907 -1.3502907 -2.9502907 -3.0502907
## [205] -2.7502907 -2.1502907 -2.7502907 -1.7502907 -3.2502907 -2.1502907
## [211] -2.6502907 -1.8502907 -3.3502907 -2.2502907 -3.2502907 -1.4502907
## [217] -2.9502907 -0.3502907 -2.7502907 -0.9502907 -2.9502907 -2.1502907
## [223] -2.1502907 -1.5502907 -1.5502907 -2.3502907 -2.1502907 -1.1502907
## [229] -2.9502907 -0.8502907 -3.3502907 -0.7502907 -2.6502907 -1.5502907
## [235] -2.5502907 -1.2502907 -3.3502907  0.1497093 -2.7502907 -2.9502907
## [241] -3.1502907 -0.1502907 -2.1502907 -0.0502907 -2.6502907 -1.0502907
## [247] -2.4502907 -1.4502907 -1.3502907 -2.5502907 -2.7502907 -0.6502907
## [253] -2.1502907 -0.1502907 -1.6502907 -2.1502907 -3.3502907 -1.0502907
## [259] -2.4502907 -1.3502907 -3.1502907 -2.0502907 -1.9502907 -1.2502907
## [265] -1.9502907 -0.8502907 -3.0502907 -1.1502907 -1.4502907 -0.9502907
## [271] -3.4502907 -1.2502907 -2.8502907 -1.4502907 -2.3502907 -1.0502907
## [277]  0.7497093  2.3497093  2.0497093  1.5497093  2.6497093  0.6497093
## [283]  1.0497093  1.0497093  1.7497093  2.7497093  0.6497093  3.1497093
## [289]  0.1497093  0.9497093 -0.0502907  2.4497093  2.8497093  0.6497093
```

```
## [295]  1.4497093  1.0497093  0.1497093  0.3497093 -0.5502907  2.2497093
## [301]  0.7497093  1.8497093  1.2497093  1.8497093  0.6497093  2.8497093
## [307] -0.5502907  3.6497093 -0.4502907  1.6497093  1.4497093 -0.3502907
## [313]  1.1497093  3.5497093 -0.5502907  2.7497093  2.3497093  0.3497093
## [319]  1.9497093 -0.1502907  0.7497093  1.3497093  0.7497093  2.4497093
## [325]  1.5497093  0.1497093 -0.7502907  1.8497093  0.1497093  2.5497093
## [331]  0.1497093  1.6497093 -0.5502907  2.7497093  1.6497093  2.2497093
## [337]  2.3497093 -0.6502907 -0.1502907  2.6497093  0.9497093  1.0497093
## [343]  1.8497093  1.5497093
```

4.- Coeficiente de variacion

```
CV<- sd(penguins$grosor_pico_mm)/mean(penguins$grosor_pico_mm)*100
CV
```

```
## [1] 11.49165
```

5.- Rango intercuartilico (IQR)

```
IQR(penguins$grosor_pico_mm)
```

```
## [1] 3.1
```

6.- Rango

```
pico<-penguins$grosor_pico_mm
rango<-max(pico)-min(pico)
rango
```

```
## [1] 8.4
```

Medidas de posición

1.- Cuartiles

```
summary(penguins)
```

```
##       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(penguins[["masa_corporal_g"]],
                  p=c(.20, .40, .60, .80))
quintil
```

```
##  20%  40%  60%  80%
## 3475 3800 4300 4950
```

3.- Decil

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

```
##  10%  20%  30%  40%  50%  60%  70%  80%  90%
## 3300 3475 3650 3800 4050 4300 4650 4950 5400
```

Percentil

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

```
##    33%    66%    99%
## 3700.0 4500.0 5978.5
```

Interpretacion: <3700 = Bajo 3700-4500 = Intermedio >4500 = Alto