# Medidas

Kevin Jaciel Bautista Antonio

2023-12-06

# MEDIDAS

Se trabajará con la matriz de datos "penguins.xlsx" Obtenida de https://allisonhorst.github.io/palmerpenguins/

## Exportacion de la matriz penguins.xlsx

1.1 Instalación de la paquetería

```
install.packages("readxl")
```

```
## Installing package into '/cloud/lib/x86_64-pc-linux-gnu-library/4.3'
## (as 'lib' is unspecified)
```

1.2 Abrir librería

```
library(readxl)
```

1.3 Exportación de la matriz de datos

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

## Exploracion de la matriz

1.- Dimensión de la matriz ocupando:

```
dim(penguins)
```

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

2.- Tipo de variables

```
str(penguins)
```

```
## 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 ...
```

3.- Nombre de las columnas

```r
colnames(penguins)
```

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

4.- Busqueda de datos perdidos

```r
anyNA(penguins)
```

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

## Tendencia Central

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

2.1.- Se descarga el paquete “moodest”

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

```
## Installing package into '/cloud/lib/x86_64-pc-linux-gnu-library/4.3'
## (as 'lib' is unspecified)
```

2.2.- Se abre la librería

```r
library(modeest)
```

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

```r
mfv(penguins$isla) # categorica
```

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

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

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

## Medidas de posición

1.- Cuartiles (cuantiles)

```
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
```

1.1.- Selección de una variable de la matriz de datos, en este caso será: **largo de la aleta**

```
largo_aleta_mm<-penguins$largo_aleta_mm
```

1.2.- Visualizamos la tabla con los datos de la variable seleccionada:

```
table(largo_aleta_mm)
```

```
## largo_aleta_mm
## 172 174 176 178 179 180 181 182 183 184 185 186 187 188 189 190 191 192 193 194
##   1   1   1   4   1   5   7   3   2   7   9   7  16   6   7  23  13   7  15   5
## 195 196 197 198 199 200 201 202 203 205 206 207 208 209 210 211 212 213 214 215
##  17  10  10   8   6   4   6   4   5   3   1   2   8   5  14   2   7   6   6  12
## 216 217 218 219 220 221 222 223 224 225 226 228 229 230 231
##   8   6   5   5   8   5   7   2   3   4   1   4   2   7   1
```

2.- Sacamos los quintiles de la misma variable, es decir: **largo de la aleta**

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

2.1.- Visualización de la variable:

```
quintil
```

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

3.- Sacamos los deciles de la misma variable, es decir: **largo de la aleta**

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

3.1.- Visualización de la variable

```
decil
```

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

4.- Sacamos los percentiles de la misma variable, es decir: **largo de la aleta**

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

4.1.- Visualizamos la variable.

```
percentil
```

```
## 33% 66%
## 192 209
```

## Interpretación de los percentiles:

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

Visualizamos la tabla con los datos de la variable seleccionada

```
table(largo_aleta_mm)
```

```
## largo_aleta_mm
## 172 174 176 178 179 180 181 182 183 184 185 186 187 188 189 190 191 192 193 194
##   1   1   1   4   1   5   7   3   2   7   9   7  16   6   7  23  13   7  15   5
## 195 196 197 198 199 200 201 202 203 205 206 207 208 209 210 211 212 213 214 215
##  17  10  10   8   6   4   6   4   5   3   1   2   8   5  14   2   7   6   6  12
## 216 217 218 219 220 221 222 223 224 225 226 228 229 230 231
##   8   6   5   5   8   5   7   2   3   4   1   4   2   7   1
```

## Medidas de dispersión

1.- Cálculo de la varianza (Solo se pueden usar 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

3.1.- Primero se calcula la media utilizando una variable, en este caso será: **largo del pico**

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

3.2.- Se calcula el error utilizando la misma variable:

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

3.3.- Se visualiza el error

```
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

4.1.- Se calcula el coeficiente de variación de una variable, en este caso será **largo de pico**

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

4.2.- Se visualiza el coeficiente de variación

```
CV
```

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

5.- Rango Intercuartílico

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

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

6.- Rango

6.1.- Se selecciona una variable, en este caso será: **largo del pico**

```
pico<-penguins$largo_pico_mm
```

6.2.- Se calcula el rango de la variable seleccionada

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

6.3.- Se visualiza el rango

```
rango
```

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