MRLS

Laura Lizbeth Ortiz Velasco

2023-12-06

Modelo de Regresión lineal simple

Lectura de matriz de datos

1.- Exportar la matriz penguins.xlsx

1.1.- Instalación de paquetería

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

1.2.- Abrir librería

```
library("readxl")
```

1.3.- Exportación de la matriz de datos

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

2.- Exploración de la matriz

2.1.- Dimensión de la matriz

```
dim(penguins)
```

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

2.2.- Nombre de las columnas

```
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 ...
```

2.3.- Tipo de variables

```
colnames(penguins)
```

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

2.4.- En busca de datos perdidos

```r
anyNA(penguins)
```

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

Configuración de la matriz

1.- Visualización de las columnas: *especie, isla, género y año*

1.1.- Especie

```r
penguins$especie
```

```
##   [1] "Adelie"    "Adelie"    "Adelie"    "Adelie"    "Adelie"    "Adelie"
##   [7] "Adelie"    "Adelie"    "Adelie"    "Adelie"    "Adelie"    "Adelie"
##  [13] "Adelie"    "Adelie"    "Adelie"    "Adelie"    "Adelie"    "Adelie"
##  [19] "Adelie"    "Adelie"    "Adelie"    "Adelie"    "Adelie"    "Adelie"
##  [25] "Adelie"    "Adelie"    "Adelie"    "Adelie"    "Adelie"    "Adelie"
##  [31] "Adelie"    "Adelie"    "Adelie"    "Adelie"    "Adelie"    "Adelie"
##  [37] "Adelie"    "Adelie"    "Adelie"    "Adelie"    "Adelie"    "Adelie"
##  [43] "Adelie"    "Adelie"    "Adelie"    "Adelie"    "Adelie"    "Adelie"
##  [49] "Adelie"    "Adelie"    "Adelie"    "Adelie"    "Adelie"    "Adelie"
##  [55] "Adelie"    "Adelie"    "Adelie"    "Adelie"    "Adelie"    "Adelie"
##  [61] "Adelie"    "Adelie"    "Adelie"    "Adelie"    "Adelie"    "Adelie"
##  [67] "Adelie"    "Adelie"    "Adelie"    "Adelie"    "Adelie"    "Adelie"
##  [73] "Adelie"    "Adelie"    "Adelie"    "Adelie"    "Adelie"    "Adelie"
##  [79] "Adelie"    "Adelie"    "Adelie"    "Adelie"    "Adelie"    "Adelie"
##  [85] "Adelie"    "Adelie"    "Adelie"    "Adelie"    "Adelie"    "Adelie"
##  [91] "Adelie"    "Adelie"    "Adelie"    "Adelie"    "Adelie"    "Adelie"
##  [97] "Adelie"    "Adelie"    "Adelie"    "Adelie"    "Adelie"    "Adelie"
## [103] "Adelie"    "Adelie"    "Adelie"    "Adelie"    "Adelie"    "Adelie"
## [109] "Adelie"    "Adelie"    "Adelie"    "Adelie"    "Adelie"    "Adelie"
## [115] "Adelie"    "Adelie"    "Adelie"    "Adelie"    "Adelie"    "Adelie"
## [121] "Adelie"    "Adelie"    "Adelie"    "Adelie"    "Adelie"    "Adelie"
## [127] "Adelie"    "Adelie"    "Adelie"    "Adelie"    "Adelie"    "Adelie"
## [133] "Adelie"    "Adelie"    "Adelie"    "Adelie"    "Adelie"    "Adelie"
## [139] "Adelie"    "Adelie"    "Adelie"    "Adelie"    "Adelie"    "Adelie"
## [145] "Adelie"    "Adelie"    "Adelie"    "Adelie"    "Adelie"    "Adelie"
## [151] "Adelie"    "Adelie"    "Gentoo"    "Gentoo"    "Gentoo"    "Gentoo"
## [157] "Gentoo"    "Gentoo"    "Gentoo"    "Gentoo"    "Gentoo"    "Gentoo"
## [163] "Gentoo"    "Gentoo"    "Gentoo"    "Gentoo"    "Gentoo"    "Gentoo"
## [169] "Gentoo"    "Gentoo"    "Gentoo"    "Gentoo"    "Gentoo"    "Gentoo"
## [175] "Gentoo"    "Gentoo"    "Gentoo"    "Gentoo"    "Gentoo"    "Gentoo"
## [181] "Gentoo"    "Gentoo"    "Gentoo"    "Gentoo"    "Gentoo"    "Gentoo"
## [187] "Gentoo"    "Gentoo"    "Gentoo"    "Gentoo"    "Gentoo"    "Gentoo"
## [193] "Gentoo"    "Gentoo"    "Gentoo"    "Gentoo"    "Gentoo"    "Gentoo"
## [199] "Gentoo"    "Gentoo"    "Gentoo"    "Gentoo"    "Gentoo"    "Gentoo"
## [205] "Gentoo"    "Gentoo"    "Gentoo"    "Gentoo"    "Gentoo"    "Gentoo"
## [211] "Gentoo"    "Gentoo"    "Gentoo"    "Gentoo"    "Gentoo"    "Gentoo"
## [217] "Gentoo"    "Gentoo"    "Gentoo"    "Gentoo"    "Gentoo"    "Gentoo"
## [223] "Gentoo"    "Gentoo"    "Gentoo"    "Gentoo"    "Gentoo"    "Gentoo"
## [229] "Gentoo"    "Gentoo"    "Gentoo"    "Gentoo"    "Gentoo"    "Gentoo"
## [235] "Gentoo"    "Gentoo"    "Gentoo"    "Gentoo"    "Gentoo"    "Gentoo"
## [241] "Gentoo"    "Gentoo"    "Gentoo"    "Gentoo"    "Gentoo"    "Gentoo"
## [247] "Gentoo"    "Gentoo"    "Gentoo"    "Gentoo"    "Gentoo"    "Gentoo"
## [253] "Gentoo"    "Gentoo"    "Gentoo"    "Gentoo"    "Gentoo"    "Gentoo"
## [259] "Gentoo"    "Gentoo"    "Gentoo"    "Gentoo"    "Gentoo"    "Gentoo"
```

```
## [265] "Gentoo"    "Gentoo"    "Gentoo"    "Gentoo"    "Gentoo"    "Gentoo"
## [271] "Gentoo"    "Gentoo"    "Gentoo"    "Gentoo"    "Gentoo"    "Gentoo"
## [277] "Chinstrap" "Chinstrap" "Chinstrap" "Chinstrap" "Chinstrap" "Chinstrap"
## [283] "Chinstrap" "Chinstrap" "Chinstrap" "Chinstrap" "Chinstrap" "Chinstrap"
## [289] "Chinstrap" "Chinstrap" "Chinstrap" "Chinstrap" "Chinstrap" "Chinstrap"
## [295] "Chinstrap" "Chinstrap" "Chinstrap" "Chinstrap" "Chinstrap" "Chinstrap"
## [301] "Chinstrap" "Chinstrap" "Chinstrap" "Chinstrap" "Chinstrap" "Chinstrap"
## [307] "Chinstrap" "Chinstrap" "Chinstrap" "Chinstrap" "Chinstrap" "Chinstrap"
## [313] "Chinstrap" "Chinstrap" "Chinstrap" "Chinstrap" "Chinstrap" "Chinstrap"
## [319] "Chinstrap" "Chinstrap" "Chinstrap" "Chinstrap" "Chinstrap" "Chinstrap"
## [325] "Chinstrap" "Chinstrap" "Chinstrap" "Chinstrap" "Chinstrap" "Chinstrap"
## [331] "Chinstrap" "Chinstrap" "Chinstrap" "Chinstrap" "Chinstrap" "Chinstrap"
## [337] "Chinstrap" "Chinstrap" "Chinstrap" "Chinstrap" "Chinstrap" "Chinstrap"
## [343] "Chinstrap" "Chinstrap"
```

1.2.- Isla

```
penguins$isla
```

```
##   [1] "Torgersen" "Torgersen" "Torgersen" "Torgersen" "Torgersen" "Torgersen"
##   [7] "Torgersen" "Torgersen" "Torgersen" "Torgersen" "Torgersen" "Torgersen"
##  [13] "Torgersen" "Torgersen" "Torgersen" "Torgersen" "Torgersen" "Torgersen"
##  [19] "Torgersen" "Torgersen" "Biscoe"    "Biscoe"    "Biscoe"    "Biscoe"
##  [25] "Biscoe"    "Biscoe"    "Biscoe"    "Biscoe"    "Biscoe"    "Biscoe"
##  [31] "Dream"     "Dream"     "Dream"     "Dream"     "Dream"     "Dream"
##  [37] "Dream"     "Dream"     "Dream"     "Dream"     "Dream"     "Dream"
##  [43] "Dream"     "Dream"     "Dream"     "Dream"     "Dream"     "Dream"
##  [49] "Dream"     "Dream"     "Biscoe"    "Biscoe"    "Biscoe"    "Biscoe"
##  [55] "Biscoe"    "Biscoe"    "Biscoe"    "Biscoe"    "Biscoe"    "Biscoe"
##  [61] "Biscoe"    "Biscoe"    "Biscoe"    "Biscoe"    "Biscoe"    "Biscoe"
##  [67] "Biscoe"    "Biscoe"    "Torgersen" "Torgersen" "Torgersen" "Torgersen"
##  [73] "Torgersen" "Torgersen" "Torgersen" "Torgersen" "Torgersen" "Torgersen"
##  [79] "Torgersen" "Torgersen" "Torgersen" "Torgersen" "Torgersen" "Torgersen"
##  [85] "Dream"     "Dream"     "Dream"     "Dream"     "Dream"     "Dream"
##  [91] "Dream"     "Dream"     "Dream"     "Dream"     "Dream"     "Dream"
##  [97] "Dream"     "Dream"     "Dream"     "Dream"     "Biscoe"    "Biscoe"
## [103] "Biscoe"    "Biscoe"    "Biscoe"    "Biscoe"    "Biscoe"    "Biscoe"
## [109] "Biscoe"    "Biscoe"    "Biscoe"    "Biscoe"    "Biscoe"    "Biscoe"
## [115] "Biscoe"    "Biscoe"    "Torgersen" "Torgersen" "Torgersen" "Torgersen"
## [121] "Torgersen" "Torgersen" "Torgersen" "Torgersen" "Torgersen" "Torgersen"
## [127] "Torgersen" "Torgersen" "Torgersen" "Torgersen" "Torgersen" "Torgersen"
## [133] "Dream"     "Dream"     "Dream"     "Dream"     "Dream"     "Dream"
## [139] "Dream"     "Dream"     "Dream"     "Dream"     "Dream"     "Dream"
## [145] "Dream"     "Dream"     "Dream"     "Dream"     "Dream"     "Dream"
## [151] "Dream"     "Dream"     "Biscoe"    "Biscoe"    "Biscoe"    "Biscoe"
## [157] "Biscoe"    "Biscoe"    "Biscoe"    "Biscoe"    "Biscoe"    "Biscoe"
## [163] "Biscoe"    "Biscoe"    "Biscoe"    "Biscoe"    "Biscoe"    "Biscoe"
## [169] "Biscoe"    "Biscoe"    "Biscoe"    "Biscoe"    "Biscoe"    "Biscoe"
## [175] "Biscoe"    "Biscoe"    "Biscoe"    "Biscoe"    "Biscoe"    "Biscoe"
## [181] "Biscoe"    "Biscoe"    "Biscoe"    "Biscoe"    "Biscoe"    "Biscoe"
## [187] "Biscoe"    "Biscoe"    "Biscoe"    "Biscoe"    "Biscoe"    "Biscoe"
## [193] "Biscoe"    "Biscoe"    "Biscoe"    "Biscoe"    "Biscoe"    "Biscoe"
## [199] "Biscoe"    "Biscoe"    "Biscoe"    "Biscoe"    "Biscoe"    "Biscoe"
## [205] "Biscoe"    "Biscoe"    "Biscoe"    "Biscoe"    "Biscoe"    "Biscoe"
## [211] "Biscoe"    "Biscoe"    "Biscoe"    "Biscoe"    "Biscoe"    "Biscoe"
```

```
## [217] "Biscoe"    "Biscoe"    "Biscoe"    "Biscoe"    "Biscoe"    "Biscoe"
## [223] "Biscoe"    "Biscoe"    "Biscoe"    "Biscoe"    "Biscoe"    "Biscoe"
## [229] "Biscoe"    "Biscoe"    "Biscoe"    "Biscoe"    "Biscoe"    "Biscoe"
## [235] "Biscoe"    "Biscoe"    "Biscoe"    "Biscoe"    "Biscoe"    "Biscoe"
## [241] "Biscoe"    "Biscoe"    "Biscoe"    "Biscoe"    "Biscoe"    "Biscoe"
## [247] "Biscoe"    "Biscoe"    "Biscoe"    "Biscoe"    "Biscoe"    "Biscoe"
## [253] "Biscoe"    "Biscoe"    "Biscoe"    "Biscoe"    "Biscoe"    "Biscoe"
## [259] "Biscoe"    "Biscoe"    "Biscoe"    "Biscoe"    "Biscoe"    "Biscoe"
## [265] "Biscoe"    "Biscoe"    "Biscoe"    "Biscoe"    "Biscoe"    "Biscoe"
## [271] "Biscoe"    "Biscoe"    "Biscoe"    "Biscoe"    "Biscoe"    "Biscoe"
## [277] "Dream"     "Dream"     "Dream"     "Dream"     "Dream"     "Dream"
## [283] "Dream"     "Dream"     "Dream"     "Dream"     "Dream"     "Dream"
## [289] "Dream"     "Dream"     "Dream"     "Dream"     "Dream"     "Dream"
## [295] "Dream"     "Dream"     "Dream"     "Dream"     "Dream"     "Dream"
## [301] "Dream"     "Dream"     "Dream"     "Dream"     "Dream"     "Dream"
## [307] "Dream"     "Dream"     "Dream"     "Dream"     "Dream"     "Dream"
## [313] "Dream"     "Dream"     "Dream"     "Dream"     "Dream"     "Dream"
## [319] "Dream"     "Dream"     "Dream"     "Dream"     "Dream"     "Dream"
## [325] "Dream"     "Dream"     "Dream"     "Dream"     "Dream"     "Dream"
## [331] "Dream"     "Dream"     "Dream"     "Dream"     "Dream"     "Dream"
## [337] "Dream"     "Dream"     "Dream"     "Dream"     "Dream"     "Dream"
## [343] "Dream"     "Dream"
```

1.3.- Género

```
penguins$genero
```

```
##   [1] "male"   "female" "female" "female" "female" "male"   "female" "male"
##   [9] "female" "male"   "female" "female" "female" "male"   "male"   "female"
##  [17] "female" "male"   "female" "male"   "female" "male"   "female" "male"
##  [25] "male"   "female" "male"   "female" "female" "male"   "female" "male"
##  [33] "female" "male"   "female" "male"   "male"   "female" "female" "male"
##  [41] "female" "male"   "female" "male"   "female" "male"   "male"   "female"
##  [49] "female" "male"   "female" "male"   "female" "male"   "female" "male"
##  [57] "female" "male"   "female" "male"   "female" "male"   "female" "male"
##  [65] "female" "male"   "female" "male"   "female" "male"   "female" "male"
##  [73] "female" "male"   "female" "male"   "female" "male"   "female" "male"
##  [81] "female" "male"   "female" "male"   "female" "male"   "male"   "female"
##  [89] "male"   "female" "female" "male"   "female" "male"   "female" "male"
##  [97] "female" "male"   "female" "male"   "female" "male"   "female" "male"
## [105] "female" "male"   "female" "male"   "female" "male"   "female" "male"
## [113] "female" "male"   "female" "male"   "female" "male"   "female" "male"
## [121] "female" "male"   "female" "male"   "female" "male"   "female" "male"
## [129] "female" "male"   "female" "male"   "female" "male"   "female" "male"
## [137] "female" "male"   "female" "male"   "female" "male"   "female" "male"
## [145] "female" "male"   "male"   "female" "female" "male"   "female" "male"
## [153] "female" "male"   "female" "male"   "male"   "female" "female" "male"
## [161] "female" "male"   "female" "male"   "female" "male"   "female" "male"
## [169] "female" "male"   "female" "male"   "male"   "female" "female" "male"
## [177] "female" "male"   "female" "male"   "female" "male"   "male"   "female"
## [185] "female" "male"   "female" "male"   "female" "male"   "female" "male"
## [193] "female" "male"   "female" "male"   "male"   "female" "female" "male"
## [201] "female" "male"   "female" "male"   "female" "male"   "female" "male"
## [209] "female" "male"   "female" "male"   "female" "male"   "female" "male"
## [217] "female" "male"   "female" "male"   "female" "male"   "female" "male"
```

```
## [225] "male"   "female" "female" "male"   "female" "male"   "female" "male"
## [233] "female" "male"   "female" "male"   "female" "male"   "female" "male"
## [241] "female" "male"   "female" "male"   "female" "male"   "female" "male"
## [249] "male"   "female" "female" "male"   "female" "male"   "female" "male"
## [257] "female" "male"   "female" "male"   "female" "male"   "female" "male"
## [265] "female" "male"   "female" "male"   "female" "male"   "female" "male"
## [273] "female" "male"   "female" "male"   "female" "male"   "male"   "female"
## [281] "male"   "female" "female" "male"   "female" "male"   "female" "male"
## [289] "female" "male"   "female" "male"   "male"   "female" "female" "male"
## [297] "female" "male"   "female" "male"   "female" "male"   "female" "male"
## [305] "female" "male"   "female" "male"   "female" "male"   "male"   "female"
## [313] "female" "male"   "female" "male"   "male"   "female" "male"   "female"
## [321] "female" "male"   "female" "male"   "male"   "female" "female" "male"
## [329] "female" "male"   "female" "male"   "female" "male"   "male"   "female"
## [337] "male"   "female" "female" "male"   "female" "male"   "male"   "female"
```

1.4.- Año

```
penguins$año
```

```
##   [1] 2007 2007 2007 2007 2007 2007 2007 2007 2007 2007 2007 2007 2007 2007 2007
##  [16] 2007 2007 2007 2007 2007 2007 2007 2007 2007 2007 2007 2007 2007 2007 2007
##  [31] 2007 2007 2007 2007 2007 2007 2007 2007 2007 2007 2007 2007 2007 2007 2007
##  [46] 2007 2007 2007 2007 2007 2008 2008 2008 2008 2008 2008 2008 2008 2008 2008
##  [61] 2008 2008 2008 2008 2008 2008 2008 2008 2008 2008 2008 2008 2008 2008 2008
##  [76] 2008 2008 2008 2008 2008 2008 2008 2008 2008 2008 2008 2008 2008 2008 2008
##  [91] 2008 2008 2008 2008 2008 2008 2008 2008 2008 2008 2009 2009 2009 2009 2009
## [106] 2009 2009 2009 2009 2009 2009 2009 2009 2009 2009 2009 2009 2009 2009 2009
## [121] 2009 2009 2009 2009 2009 2009 2009 2009 2009 2009 2009 2009 2009 2009 2009
## [136] 2009 2009 2009 2009 2009 2009 2009 2009 2009 2009 2009 2009 2009 2009 2009
## [151] 2009 2009 2007 2007 2007 2007 2007 2007 2007 2007 2007 2007 2007 2007 2007
## [166] 2007 2007 2007 2007 2007 2007 2007 2007 2007 2007 2007 2007 2007 2007 2007
## [181] 2007 2007 2007 2007 2007 2007 2008 2008 2008 2008 2008 2008 2008 2008 2008
## [196] 2008 2008 2008 2008 2008 2008 2008 2008 2008 2008 2008 2008 2008 2008 2008
## [211] 2008 2008 2008 2008 2008 2008 2008 2008 2008 2008 2008 2008 2008 2008 2008
## [226] 2008 2008 2008 2008 2008 2008 2008 2009 2009 2009 2009 2009 2009 2009 2009
## [241] 2009 2009 2009 2009 2009 2009 2009 2009 2009 2009 2009 2009 2009 2009 2009
## [256] 2009 2009 2009 2009 2009 2009 2009 2009 2009 2009 2009 2009 2009 2009 2009
## [271] 2009 2009 2009 2009 2009 2009 2007 2007 2007 2007 2007 2007 2007 2007 2007
## [286] 2007 2007 2007 2007 2007 2007 2007 2007 2007 2007 2007 2007 2007 2007 2007
## [301] 2007 2007 2008 2008 2008 2008 2008 2008 2008 2008 2008 2008 2008 2008 2008
## [316] 2008 2008 2008 2008 2008 2009 2009 2009 2009 2009 2009 2009 2009 2009 2009
## [331] 2009 2009 2009 2009 2009 2009 2009 2009 2009 2009 2009 2009 2009 2009
```

2.- Convertir las variables categóricas a factores

2.1.- Especie

```
penguins$especie<-factor(penguins$especie,
                         levels=c("Adelie", "Gentoo", "Chinstrap"))
```

2.2.- Isla

```
penguins$isla<-factor(penguins$isla,
                      levels=c("Torgersen", "Biscoe", "Dream"))
```

2.3.- Género

```
penguins$genero<-factor(penguins$genero,
                        levels=c("male", "female"))
```

2.4.- Año

```
penguins$año<-factor(penguins$año,
                     levels=c("2007", "2008", "2009"))
```

3.- Visualizar el tipo de variables que tenemos ahora

```
str(penguins)
```

```
## tibble [344 x 9] (S3: tbl_df/tbl/data.frame)
##  $ ID             : chr [1:344] "i1" "i2" "i3" "i4" ...
##  $ especie        : Factor w/ 3 levels "Adelie","Gentoo",..: 1 1 1 1 1 1 1 1 1 1 ...
##  $ isla           : Factor w/ 3 levels "Torgersen","Biscoe",..: 1 1 1 1 1 1 1 1 1 1 ...
##  $ 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         : Factor w/ 2 levels "male","female": 1 2 2 2 2 1 2 1 2 1 ...
##  $ año            : Factor w/ 3 levels "2007","2008",..: 1 1 1 1 1 1 1 1 1 1 ...
```

Selección de variables

1.- Se seleccionarán los datos de la especie gentoo y se crea una nueva matriz llamada “gentoo”

1.1.- Se selecciona la variable tomada de la matriz original

```
penguins$especie
```

```
##   [1] Adelie    Adelie    Adelie    Adelie    Adelie    Adelie    Adelie
##   [8] Adelie    Adelie    Adelie    Adelie    Adelie    Adelie    Adelie
##  [15] Adelie    Adelie    Adelie    Adelie    Adelie    Adelie    Adelie
##  [22] Adelie    Adelie    Adelie    Adelie    Adelie    Adelie    Adelie
##  [29] Adelie    Adelie    Adelie    Adelie    Adelie    Adelie    Adelie
##  [36] Adelie    Adelie    Adelie    Adelie    Adelie    Adelie    Adelie
##  [43] Adelie    Adelie    Adelie    Adelie    Adelie    Adelie    Adelie
##  [50] Adelie    Adelie    Adelie    Adelie    Adelie    Adelie    Adelie
##  [57] Adelie    Adelie    Adelie    Adelie    Adelie    Adelie    Adelie
##  [64] Adelie    Adelie    Adelie    Adelie    Adelie    Adelie    Adelie
##  [71] Adelie    Adelie    Adelie    Adelie    Adelie    Adelie    Adelie
##  [78] Adelie    Adelie    Adelie    Adelie    Adelie    Adelie    Adelie
##  [85] Adelie    Adelie    Adelie    Adelie    Adelie    Adelie    Adelie
##  [92] Adelie    Adelie    Adelie    Adelie    Adelie    Adelie    Adelie
##  [99] Adelie    Adelie    Adelie    Adelie    Adelie    Adelie    Adelie
## [106] Adelie    Adelie    Adelie    Adelie    Adelie    Adelie    Adelie
## [113] Adelie    Adelie    Adelie    Adelie    Adelie    Adelie    Adelie
## [120] Adelie    Adelie    Adelie    Adelie    Adelie    Adelie    Adelie
## [127] Adelie    Adelie    Adelie    Adelie    Adelie    Adelie    Adelie
## [134] Adelie    Adelie    Adelie    Adelie    Adelie    Adelie    Adelie
## [141] Adelie    Adelie    Adelie    Adelie    Adelie    Adelie    Adelie
## [148] Adelie    Adelie    Adelie    Adelie    Adelie    Gentoo    Gentoo
## [155] Gentoo    Gentoo    Gentoo    Gentoo    Gentoo    Gentoo    Gentoo
## [162] Gentoo    Gentoo    Gentoo    Gentoo    Gentoo    Gentoo    Gentoo
## [169] Gentoo    Gentoo    Gentoo    Gentoo    Gentoo    Gentoo    Gentoo
## [176] Gentoo    Gentoo    Gentoo    Gentoo    Gentoo    Gentoo    Gentoo
```

```
## [183] Gentoo    Gentoo    Gentoo    Gentoo    Gentoo    Gentoo    Gentoo
## [190] Gentoo    Gentoo    Gentoo    Gentoo    Gentoo    Gentoo    Gentoo
## [197] Gentoo    Gentoo    Gentoo    Gentoo    Gentoo    Gentoo    Gentoo
## [204] Gentoo    Gentoo    Gentoo    Gentoo    Gentoo    Gentoo    Gentoo
## [211] Gentoo    Gentoo    Gentoo    Gentoo    Gentoo    Gentoo    Gentoo
## [218] Gentoo    Gentoo    Gentoo    Gentoo    Gentoo    Gentoo    Gentoo
## [225] Gentoo    Gentoo    Gentoo    Gentoo    Gentoo    Gentoo    Gentoo
## [232] Gentoo    Gentoo    Gentoo    Gentoo    Gentoo    Gentoo    Gentoo
## [239] Gentoo    Gentoo    Gentoo    Gentoo    Gentoo    Gentoo    Gentoo
## [246] Gentoo    Gentoo    Gentoo    Gentoo    Gentoo    Gentoo    Gentoo
## [253] Gentoo    Gentoo    Gentoo    Gentoo    Gentoo    Gentoo    Gentoo
## [260] Gentoo    Gentoo    Gentoo    Gentoo    Gentoo    Gentoo    Gentoo
## [267] Gentoo    Gentoo    Gentoo    Gentoo    Gentoo    Gentoo    Gentoo
## [274] Gentoo    Gentoo    Gentoo    Chinstrap Chinstrap Chinstrap Chinstrap
## [281] Chinstrap Chinstrap Chinstrap Chinstrap Chinstrap Chinstrap Chinstrap
## [288] Chinstrap Chinstrap Chinstrap Chinstrap Chinstrap Chinstrap Chinstrap
## [295] Chinstrap Chinstrap Chinstrap Chinstrap Chinstrap Chinstrap Chinstrap
## [302] Chinstrap Chinstrap Chinstrap Chinstrap Chinstrap Chinstrap Chinstrap
## [309] Chinstrap Chinstrap Chinstrap Chinstrap Chinstrap Chinstrap Chinstrap
## [316] Chinstrap Chinstrap Chinstrap Chinstrap Chinstrap Chinstrap Chinstrap
## [323] Chinstrap Chinstrap Chinstrap Chinstrap Chinstrap Chinstrap Chinstrap
## [330] Chinstrap Chinstrap Chinstrap Chinstrap Chinstrap Chinstrap Chinstrap
## [337] Chinstrap Chinstrap Chinstrap Chinstrap Chinstrap Chinstrap Chinstrap
## [344] Chinstrap
## Levels: Adelie Gentoo Chinstrap
```

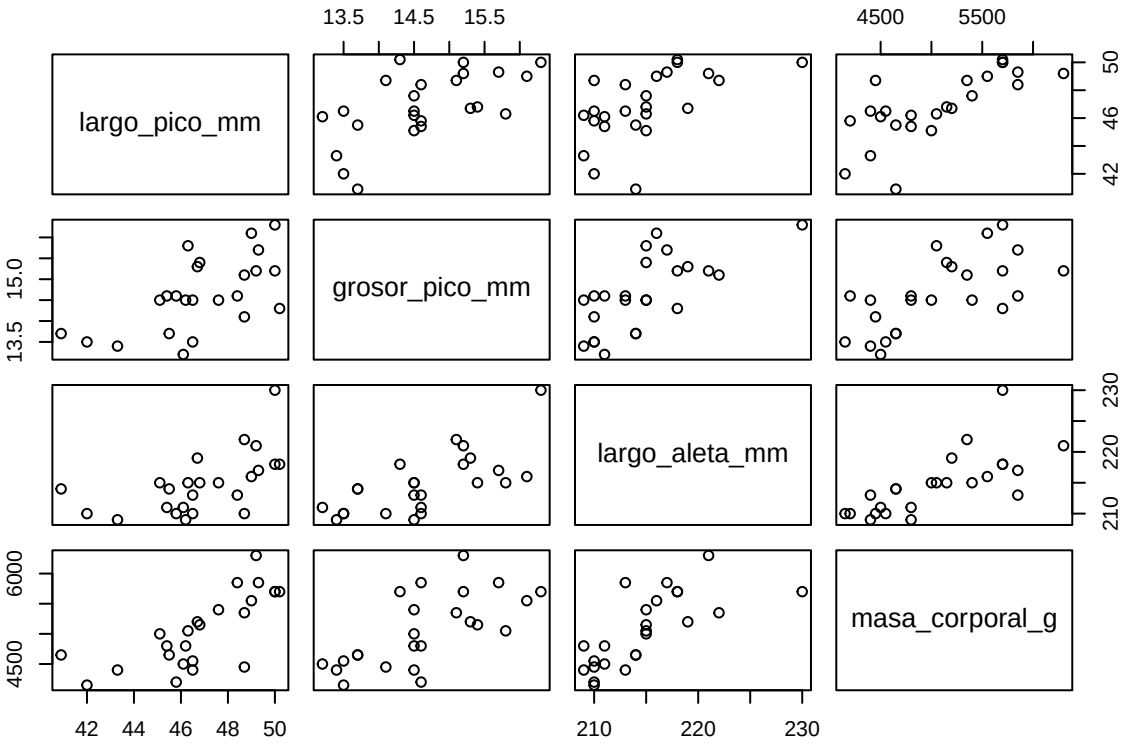
1.2.- Se seleccionan los datos con los que se quieren trabajar y las variables numéricas que se ocuparán : largo del pico, grosor del pico, largo de la aleta y masa corporal.

```
gentoo<-penguins[153:176,c(4,5,6,7)]
```

Gráfico de dispersión

1.- Mediante la función *pairs* se creará un gráfico de dispersión para visualizar nuestra nueva matriz

```
pairs(gentoo)
```



Cálculo de la correlación de Pearson

Mediante la función *cor*, se calcula la correlación de Pearson

```
cor(gentoo)
```

```
##                 largo_pico_mm grosor_pico_mm largo_aleta_mm masa_corporal_g
## largo_pico_mm       1.0000000      0.6185638      0.5781154       0.7386365
## grosor_pico_mm      0.6185638      1.0000000      0.6931901       0.6735989
## largo_aleta_mm      0.5781154      0.6931901      1.0000000       0.7205205
## masa_corporal_g     0.7386365      0.6735989      0.7205205       1.0000000
```

Gráfico de dispersión con línea de regresión

1.- Se instala la paquetería *ggplot2* y la librería

1.1.- Instalamos la paquetería “ggplot2”

```
install.packages("ggplot2")
```

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

1.2.- Abrimos librería

```
library(ggplot2)
```

2.- Se generará un gráfico de dispersión en donde se muestre la línea de regresión.

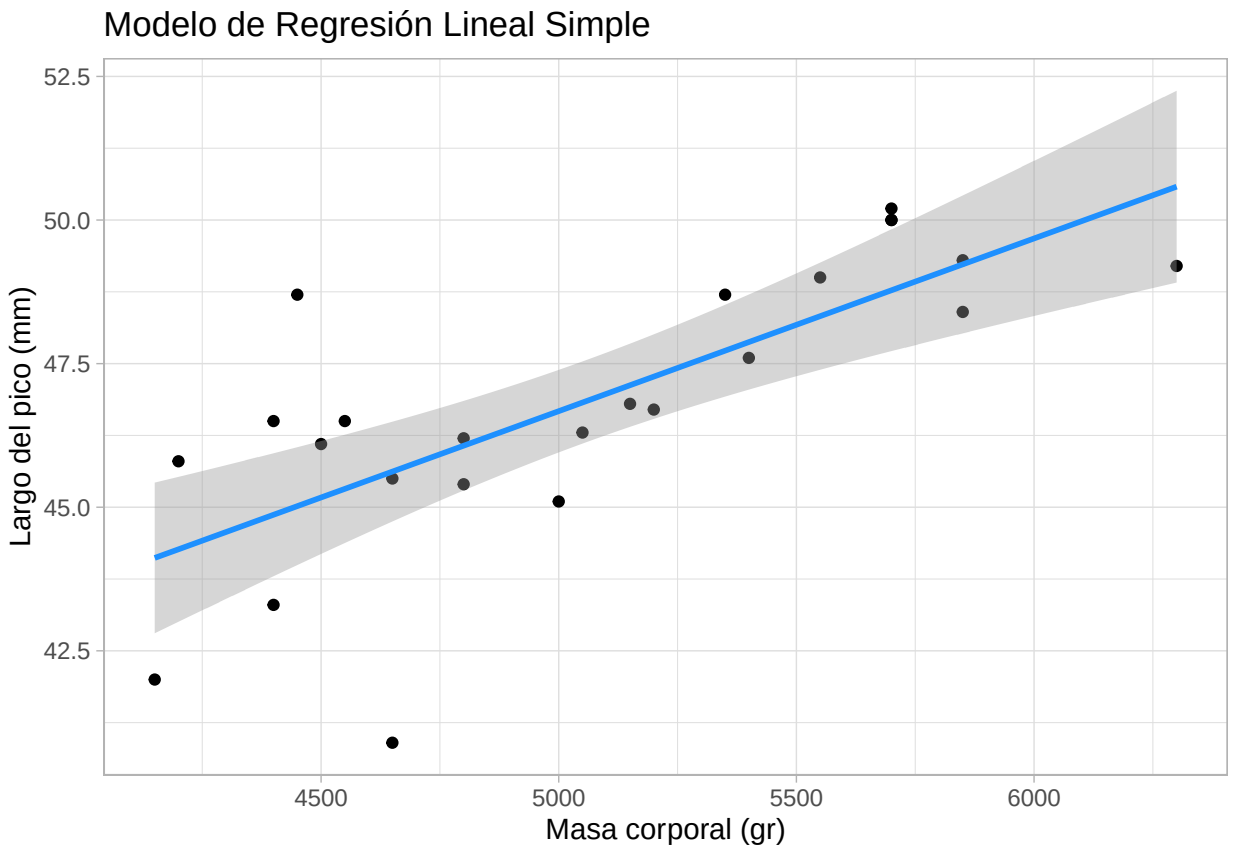
2.1.1.- El primer objeto se llamará MRL, se ocuparán las variables: *masa corporal* y *largo del pico. Mediante la función **ggplot*, creará el gráfico:

```
MRL<-ggplot(gentoo, aes(x=masa_corporal_g, y=largo_pico_mm))+
  geom_point()+
  geom_smooth(method = "lm", formula=y~x, col="dodgerblue")+
  ggtitle("Modelo de Regresión Lineal Simple")+
```

```
  xlab("Masa corporal (gr)")+
  ylab("Largo del pico (mm)")+
  theme_light()
```

2.1.2.- Se visualiza el objeto para verificar

```
MRL
```

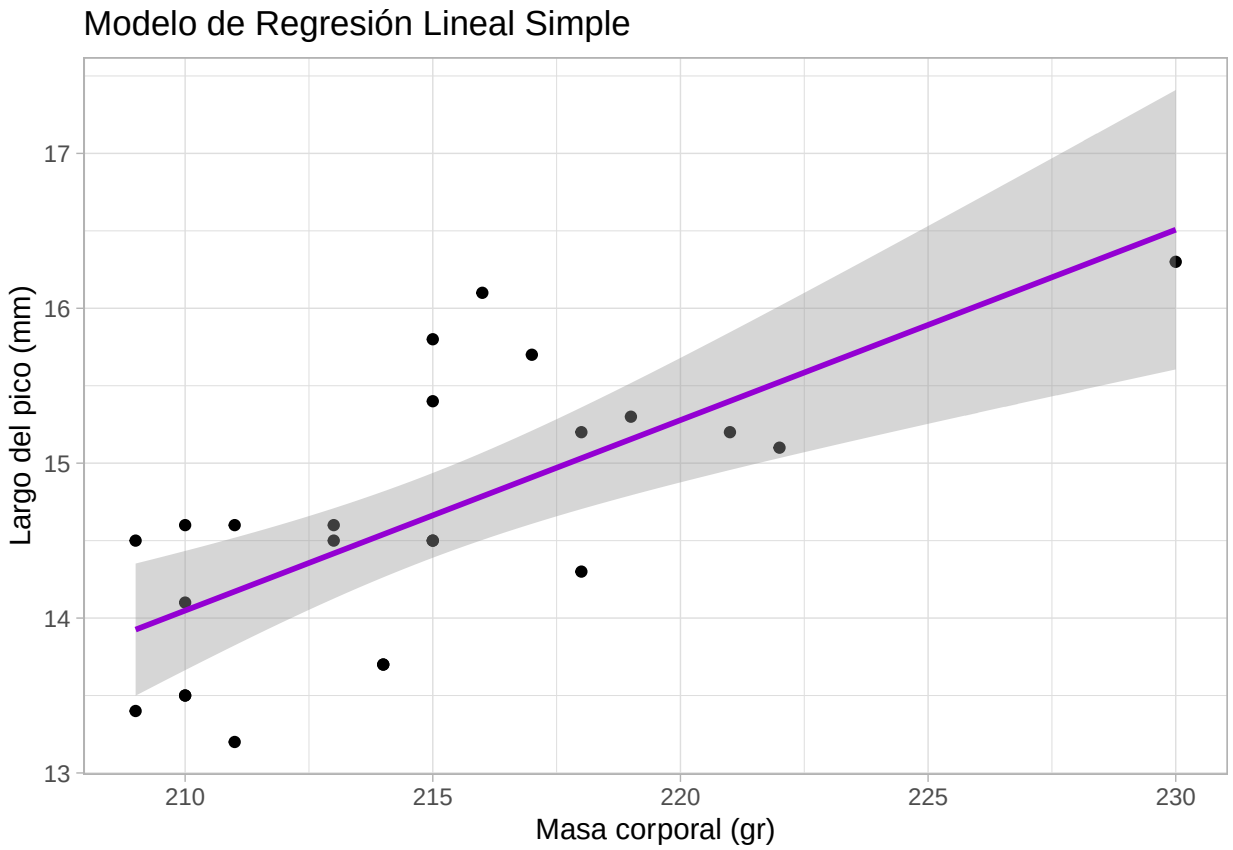


2.1.1.- El segundo objeto se llamará MRL2, se ocuparán las variables: *largo de la aleta* y *grosor del pico*.

```
MRL2<-ggplot(gentoo, aes(x=largo_aleta_mm, y=grosor_pico_mm))+
  geom_point()+
  geom_smooth(method = "lm", formula=y~x, col="darkviolet")+
  ggtitle("Modelo de Regresión Lineal Simple")+
  xlab("Masa corporal (gr)")+
  ylab("Largo del pico (mm)")+
  theme_light()
```

2.1.2.- Visualización el objeto

```
MRL2
```



Cálculo y representación de la recta por mínimos cuadrados

1.- Con la función *lm* se calcularán datos como: el intercepto, el error, el valor crítico p-valor, entre otros

1.1.1.- Primer modelo, se ocupan las variables *largo del pico* y *masa corporal*

```
regresion<-lm(gentoo$largo_pico_mm~gentoo$masa_corporal_g,
              data=gentoo)
```

1.1.2.- Se visualiza el objeto

```
summary(regresion)
```

```
##
## Call:
## lm(formula = gentoo$largo_pico_mm ~ gentoo$masa_corporal_g, data = gentoo)
##
## Residuals:
##     Min      1Q  Median      3Q     Max
## -4.7203 -0.7105 -0.0242  1.1910  3.6810
##
## Coefficients:
##                          Estimate Std. Error t value Pr(>|t|)
## (Intercept)            31.640147   2.977858  10.625 3.96e-10 ***
## gentoo$masa_corporal_g  0.003007   0.000585   5.139 3.76e-05 ***
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 1.69 on 22 degrees of freedom
```

```
## Multiple R-squared:  0.5456, Adjusted R-squared:  0.5249
## F-statistic: 26.41 on 1 and 22 DF,  p-value: 3.761e-05
```

1.2.1- Segundo modelo, ocupando las variables *largo de la aleta* y *grosor del pico*

```
regresion2<-lm(gentoo$largo_aleta_mm~gentoo$grosor_pico_mm,
               data=gentoo)
```

1.2.2.- Visualización el objeto

```
summary(regresion2)
```

```
##
## Call:
## lm(formula = gentoo$largo_aleta_mm ~ gentoo$grosor_pico_mm, data = gentoo)
##
## Residuals:
##     Min      1Q  Median      3Q     Max
## -5.2542 -2.7111 -0.3458  2.0882  8.7105
##
## Coefficients:
##                       Estimate Std. Error t value Pr(>|t|)
## (Intercept)           157.5811    12.7041  12.404  2.1e-11 ***
## gentoo$grosor_pico_mm   3.9085     0.8664   4.511 0.000173 ***
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 3.643 on 22 degrees of freedom
## Multiple R-squared:  0.4805, Adjusted R-squared:  0.4569
## F-statistic: 20.35 on 1 and 22 DF,  p-value: 0.0001731
```

Coeficiente de Correlación de Pearson (r)

1. Con la función *sqrt* se saca la raíz cuadrada del dato *Multiple R-squared* para sacar el valor del coeficiente de correlación de Pearson

1.1.1.- r del largo del pico y la masa corporal

```
r1<- sqrt(0.5456)
```

1.1.2 Se visualiza el objeto

```
r1
```

```
## [1] 0.7386474
```

1.2.1 r del largo de la aleta y el grosor del pico

```
r2<-sqrt(0.4805)
```

1.2.2 Visualización del objeto

```
r2
```

```
## [1] 0.6931811
```