MRLS

Yejyejsi Ramirez Cruz

2023-11-04

Modelo de Regresión lineal simple

Lectura de matriz de datos

Exportar la matriz penguins.xlsx

1. Instalar paqueteria

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

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

2. Abrir librería

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

3. Exportación de la matriz de datos

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

Configuracion de matriz

1.- Convertir las variables categóticas a factores

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

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

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

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

Selección de variables

1.- se seleccionaran los datos de la especie gentoo y se crea una nueva matriz llamada "gentoo"
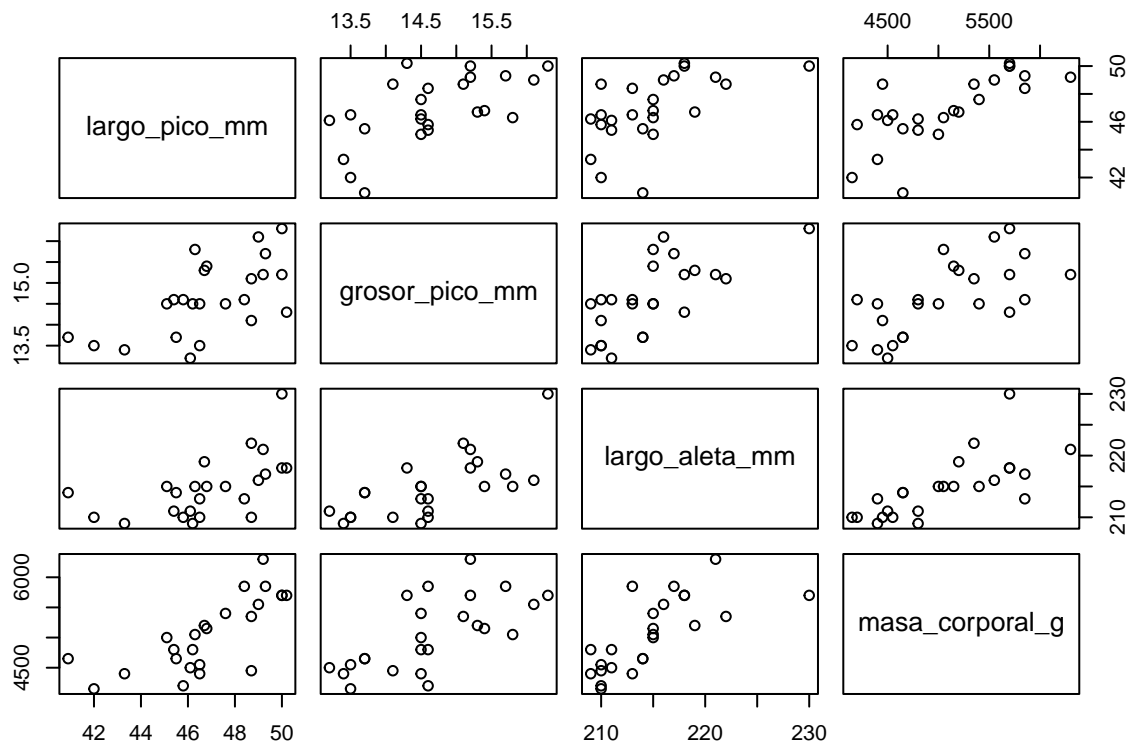
Seleccion de la especie Gentoo

```
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
```

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

Grafico de dispersion

```
pairs(gentoo)
```


Calculo de la correlacion 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
```

Grafico de dispersion con linea de regresion

1. Paquete de ggplot2

1.1 Instalar paqueteria

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

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

1.2 Abrir libreria

```
library(ggplot2)
```

2. Creación del gráfico

```
MRL<-ggplot(gentoo, aes(x=masa_corporal_g, y=largo_pico_mm))+
  geom_point()+
  geom_smooth(method = "lm", formula=y~x, col="dodgerblue1")+
  ggtitle("Modelo de Regresión Lineal Simple")+
  xlab("Masa corporal (gr)")+
  ylab("Largo del pico (mm)")+
  theme_light()
```

2.- Visualizacion del objeto

```
MRL
```


Modelo de Regresión Lineal Simple
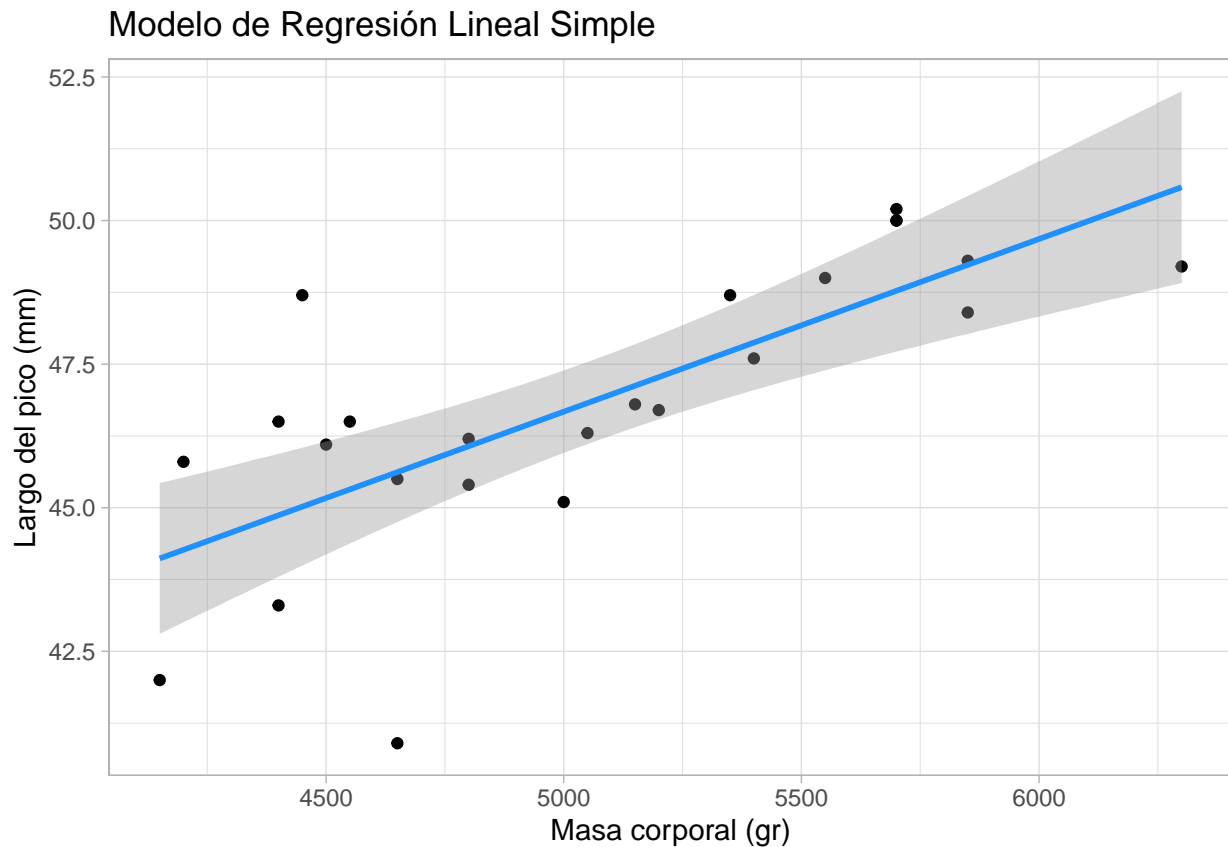
Cálculo y representación de la recta por mínimos cuadrados

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

```
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
```

Coeficiente de Correlacion de Pearson (r)

```r
sqrt(0.5456)
```

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