

MRLS

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```
# _____ Modelo de Regresión lineal simple _____  
# _____ # Lectura de matriz de datos # _____  
# Exportar la matriz penguins.xlsx #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)  
#2.-Abrimos librería  
library("readxl")  
  
# _____ - # Exploracion de la matriz # _____  
Penguins<-read_excel("Penguins.xlsx")  
  
# 2.- Dimensión de la matriz  
dim(Penguins)  
  
## [1] 344 9  
# 3.- 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 ...  
  
# 4.- 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"  
  
# 5.- En busca de datos perdidos
```

```
anyNA(Penguins)
```

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

```
#----- # Configuracion de matriz #----- #1.- Convertir las  
variables categóricas 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
```

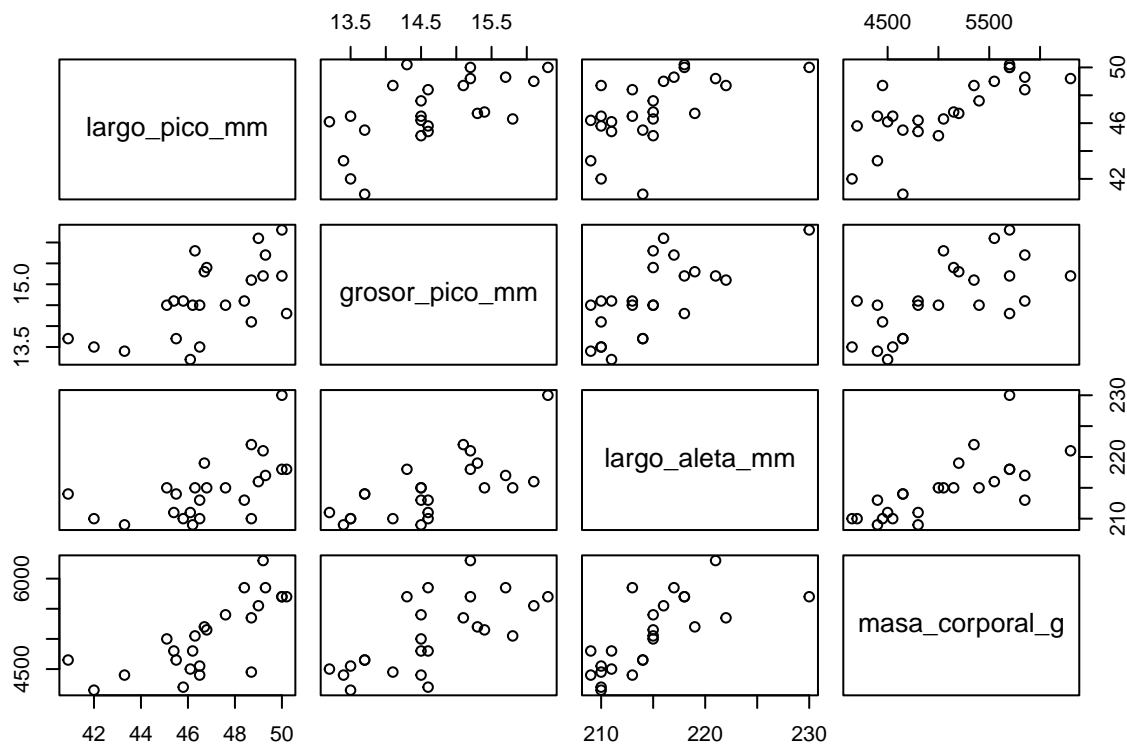
```
## [1] Adelie Adelie Adelie Adelie Adelie Adelie Adelie  
## [8] Adelie Adelie Adelie Adelie Adelie Adelie Adelie  
## [15] Adelie Adelie Adelie Adelie Adelie Adelie Adelie  
## [22] Adelie Adelie Adelie Adelie Adelie Adelie Adelie  
## [29] Adelie Adelie Adelie Adelie Adelie Adelie Adelie  
## [36] 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
```

```
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.- Instalación de la paquetería "ggplot2"
```

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

```
## Installing package into '/cloud/lib/x86_64-pc-linux-gnu-library/4.3'
```

```
## (as 'lib' is unspecified)
```

```
#2.-Abrimos librería
```

```
library(ggplot2)
```

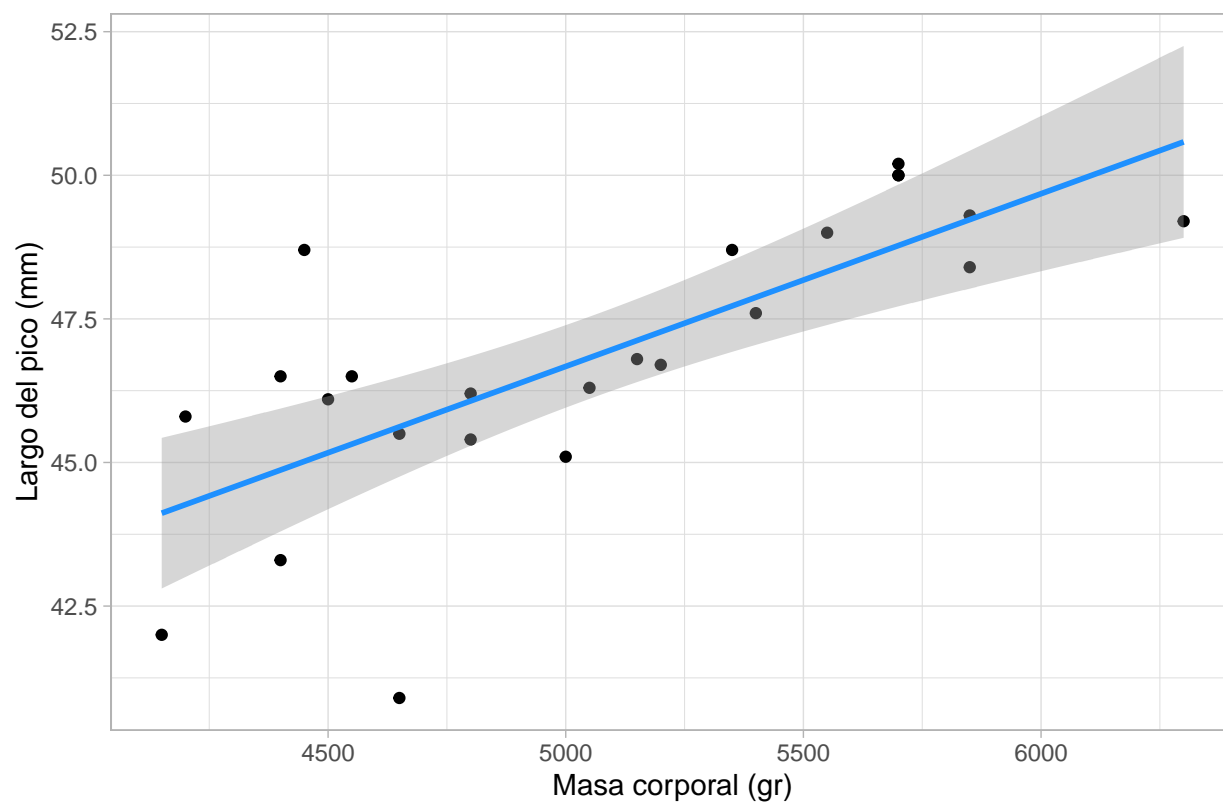
```
MRL<-ggplot(gentoo, aes(x=masa_corporal_g, y=largo_pico_mm))+
  geom_point()+
  geom_smooth(method = "lm", formula=y~x, col="dodgerblue1")+
  ggtitle("Modelo de Regresión Lineal Simple")+
  xlab("Masa corporal (gr)") +
  ylab("Largo del pico (mm)") +
  theme_light()
```

```
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.- Visualizacion del objeto
```

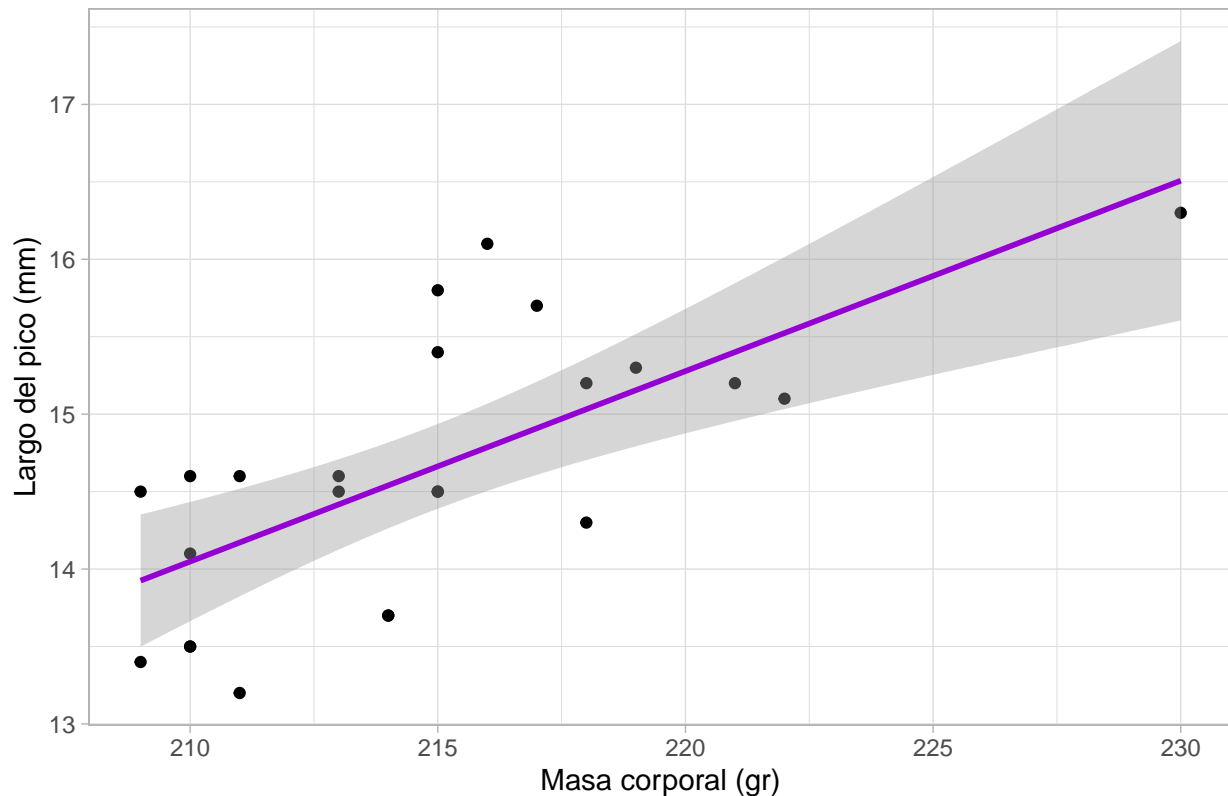
```
MRL
```

Modelo de Regresión Lineal Simple



MRL2

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
```

#-----

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

```
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 Correlacion de Pearson (r) #-----
```

```
# Del largo del pico y la masa corporal
```

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

```
r1
```

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

```
# Del largo de la aleta y el grosor del pico
```

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

```
r2
```

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