Script_6.R

marco

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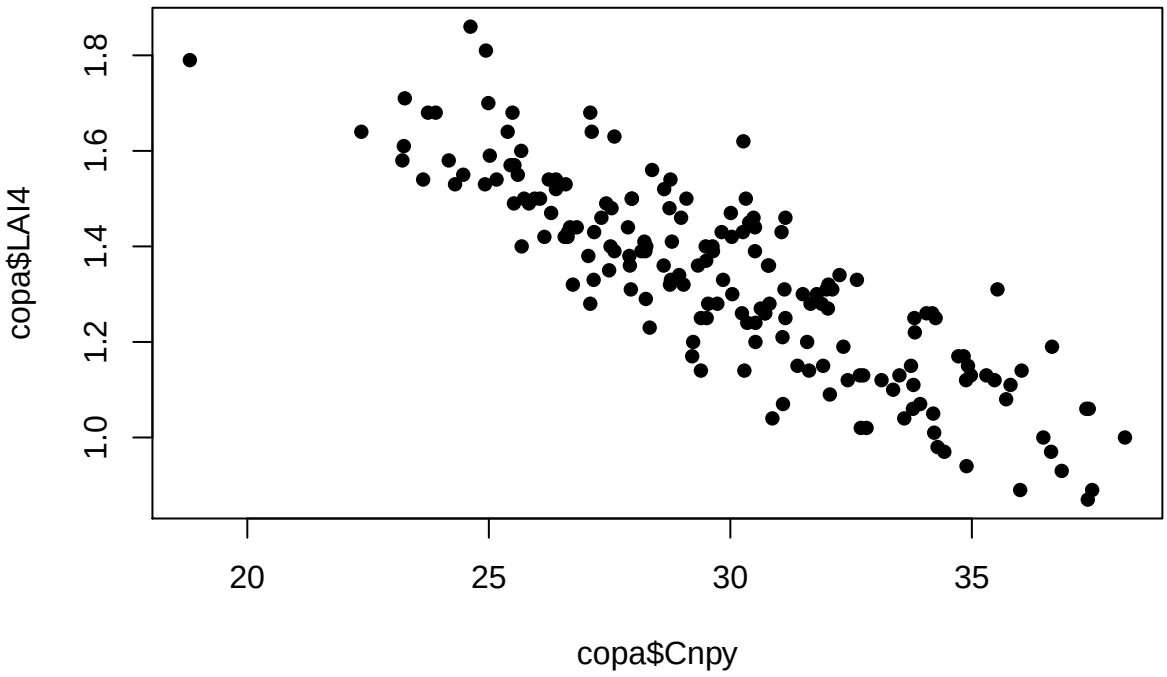
```
# Clase  # 6
#  MAGT
# 11.03.2021
# Principios de estadística
# Regresión




# Importar datos canopy ------------------------------------------------

copa <- read.csv("Datos/canopy.csv", header = T)
head(copa)
```

```
##   Photo Forest  Cnpy LAI4   GLI
## 1  4039    CBE 24.92 1.53 28.53
## 2  4040    CBE 24.30 1.53 30.58
## 3  4041    CBE 26.82 1.44 33.06
## 4  4042    CBE 33.37 1.10 38.23
## 5  4043    CBE 27.60 1.63 28.76
## 6  4044    CBE 28.98 1.46 31.99
```

```
summary(copa)
```

```
##      Photo         Forest              Cnpy            LAI4
##  Min.   :4021   Length:180         Min.   :18.81   Min.   :0.870
##  1st Qu.:4067   Class :character   1st Qu.:27.16   1st Qu.:1.170
##  Median :4122   Mode  :character   Median :29.77   Median :1.330
##  Mean   :4118                      Mean   :29.90   Mean   :1.332
##  3rd Qu.:4168                      3rd Qu.:32.36   3rd Qu.:1.480
##  Max.   :4214                      Max.   :38.17   Max.   :1.860
##       GLI
##  Min.   :17.54
##  1st Qu.:28.71
##  Median :33.25
##  Mean   :33.51
##  3rd Qu.:38.46
##  Max.   :47.65
```

```
plot(copa$Cnpy , copa$LAI4, pch=16)
```




```
cor.test(copa$Cnpy, copa$LAI4)
```

```
##
##  Pearson's product-moment correlation
##
## data:  copa$Cnpy and copa$LAI4
## t = -22.421, df = 178, p-value < 2.2e-16
## alternative hypothesis: true correlation is not equal to 0
## 95 percent confidence interval:
##  -0.8933414 -0.8156204
## sample estimates:
##        cor
## -0.8593654
```

```
copa.lm <- lm(copa$LAI4 ~ copa$Cnpy)
copa.lm
```

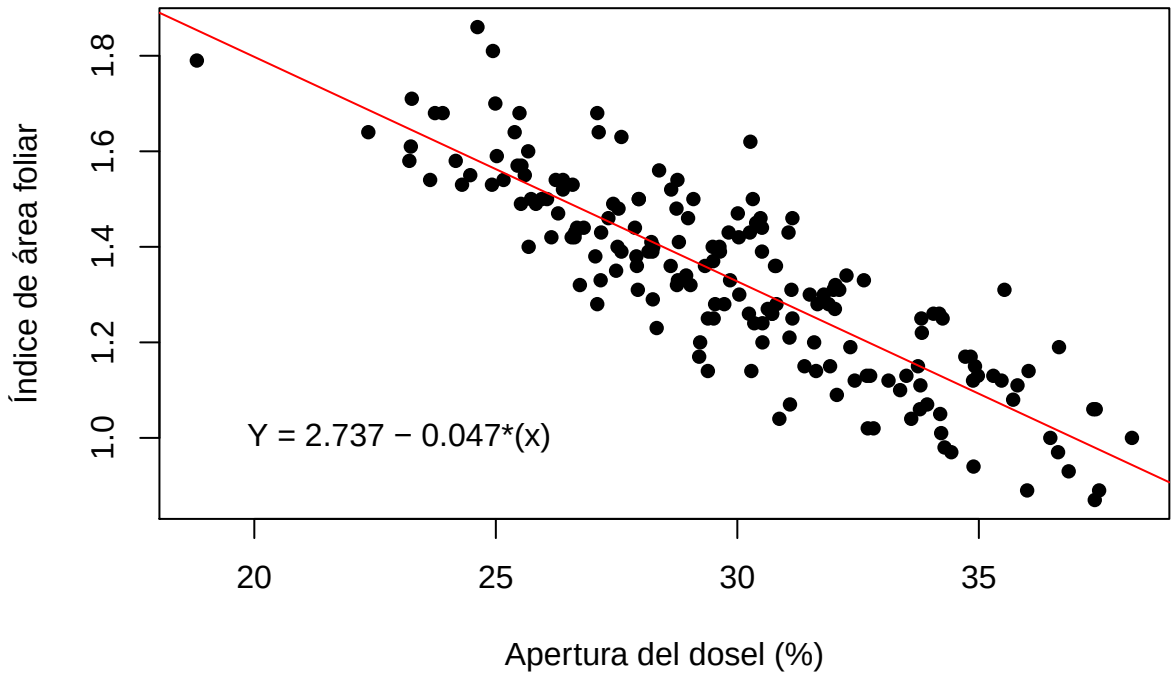
```
##
## Call:
## lm(formula = copa$LAI4 ~ copa$Cnpy)
##
## Coefficients:
## (Intercept)    copa$Cnpy
##     2.73798     -0.04701
```

```
summary(copa.lm)
```

```
##
## Call:
## lm(formula = copa$LAI4 ~ copa$Cnpy)
##
## Residuals:
##      Min       1Q   Median       3Q      Max
## -0.24665 -0.06715 -0.01653  0.06922  0.30514
```

```
##
## Coefficients:
##              Estimate Std. Error t value Pr(>|t|)
## (Intercept)  2.737978   0.063170   43.34   <2e-16 ***
## copa$Cnpy   -0.047014   0.002097  -22.42   <2e-16 ***
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 0.1032 on 178 degrees of freedom
## Multiple R-squared:  0.7385, Adjusted R-squared:  0.737
## F-statistic: 502.7 on 1 and 178 DF,  p-value: < 2.2e-16
```

```
plot(copa$Cnpy , copa$LAI4, pch=16, xlab="Apertura del dosel (%)", ylab = "Índice de área foliar")
abline(copa.lm, col="red")
text(23, 1.0, "Y = 2.737 - 0.047*(x)")
```




```
# ¿Cuáles son los valores de la línea de regresión? Agregar una columna "predichos" en la BD copa
copa.lm$fitted.values
```

```
##         1         2         3         4         5         6         7         8
## 1.5663836 1.5955325 1.4770566 1.1691135 1.4403855 1.3755059 1.3731552 1.3637524
##         9        10        11        12        13        14        15        16
## 1.5127874 1.5616822 1.4972727 1.4093562 1.3858491 1.5344140 1.5283021 1.6444272
##        17        18        19        20        21        22        23        24
## 1.2979325 1.3844386 1.2899401 1.0144368 1.2325827 1.1004728 1.3449467 1.2570301
##        25        26        27        28        29        30        31        32
## 1.4638927 1.0548690 1.1484273 1.5236007 1.3153277 1.4878699 1.0440557 1.2212993
##        33        34        35        36        37        38        39        40
## 1.1056444 1.2043742 1.1310320 1.0783761 1.2894699 1.1277410 1.3346036 1.2175382
##        41        42        43        44        45        46        47        48
## 1.3031040 1.3402453 1.0962415 1.3444766 1.2339932 1.5019742 1.3562301 1.4601315
##        49        50        51        52        53        54        55        56
## 1.5875400 1.1493676 1.3867893 1.4859893 1.3162680 1.4037145 1.5179590 1.4112367
```

```
##        57        58        59        60        61        62        63        64
## 1.6143381 1.6467779 1.4455571 1.4657732 1.8536405 1.6453675 1.4483780 1.4258111
##        65        66        67        68        69        70        71        72
## 1.3703344 1.3125069 1.4530794 1.4140576 1.3924311 1.3031040 1.2767761 1.5630926
##        73        74        75        76        77        78        79        80
## 1.3510585 1.4888102 1.6265618 1.3360140 1.5381751 1.2527988 1.4972727 1.3035742
##        81        82        83        84        85        86        87        88
## 1.1803970 1.2283514 1.4432064 1.3773865 1.2321126 1.4098263 1.3261410 1.4234604
##        89        90        91        92        93        94        95        96
## 1.4234604 1.1517183 1.6218604 1.5551002 1.5306528 1.6867400 1.3092159 1.1300917
##        97        98        99       100       101       102       103       104
## 1.1366737 1.3148576 1.2908804 1.2307022 1.2763059 1.1583003 1.5043249 0.9810567
##       105       106       107       108       109       110       111       112
## 1.4836386 1.6016443 1.4855192 1.5395855 1.3562301 1.3270813 1.0591003 1.1630017
##       113       114       115       116       117       118       119       120
## 1.3491780 1.2495078 1.3256709 1.0703837 1.2937012 1.4808178 1.3853789 1.4244007
##       121       122       123       124       125       126       127       128
## 1.4102965 1.5085562 1.4060652 1.2739552 1.4441467 1.2866491 1.2509183 1.2372841
##       129       130       131       132       133       134       135       136
## 1.2006131 1.0976519 0.9754150 1.1192785 1.1291515 0.9796463 1.0454662 1.2133069
##       137       138       139       140       141       142       143       144
## 1.1949714 1.0153771 1.0228993 0.9434453 1.0981221 1.4253410 1.1258605 1.0050339
##       145       146       147       148       149       150       151       152
## 1.4272216 1.2777164 1.3049846 1.3110965 1.3590510 1.3139173 1.3515287 1.3919609
##       153       154       155       156       157       158       159       160
## 1.1427856 1.0675628 1.1479571 1.3035742 1.2433960 1.5654434 1.4624822 1.2015533
##       161       162       163       164       165       166       167       168
## 1.0934207 1.1498377 1.5442870 1.5414661 1.5377050 1.5804879 1.3646927 1.5311230
##       169       170       171       172       173       174       175       176
## 0.9787060 1.2748955 1.2937012 1.4403855 1.1982624 1.2739552 1.3863192 1.3505884
##       177       178       179       180
## 1.2386946 1.2622017 1.4606017 1.4638927
```

```
# ¿Dónde están almacenados esos valores?
# Estan almacenados en copa.lm$fitted.values
copa$predichos <- copa.lm$fitted.values
# ¿Cuántos grados de libertad (df) tiene el análisis de regresión?
# 178 GL o df

# Determinar mediante la ecuación de regresión los siguientes valores:
#  20, 22, 24, 25, 26, 28.3, 30.3, 31.8, 33, 35

valores <-  c(20, 22, 24, 25, 26, 28.3, 30.3, 31.8, 33, 35)
2.737 - 0.047*(valores)
```

```
##  [1] 1.7970 1.7030 1.6090 1.5620 1.5150 1.4069 1.3129 1.2424 1.1860 1.0920
```