Clase-4-regresion-lineal.R

Usuario

2019-08-09

```
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# 09/08/2019
# Clase 4

# Ejercicio 1
#  Subir datos ------------------------------------------------------------

erupciones <-read.csv("C:/MCF202_2019/Datos/erupciones.csv", header = T)
summary(erupciones)
```

```
##    eruptions        waiting
##  Min.   :1.600   Min.   :43.0
##  1st Qu.:2.163   1st Qu.:58.0
##  Median :4.000   Median :76.0
##  Mean   :3.488   Mean   :70.9
##  3rd Qu.:4.454   3rd Qu.:82.0
##  Max.   :5.100   Max.   :96.0
```

```
plot(erupciones$waiting, erupciones$eruptions, pch=17, col= "blue",
     xlab= "Tiempo de espera (min)",
     ylab= "Duracion (min)")
library(pastecs)
stat.desc(erupciones$eruptions, basic = FALSE, norm = TRUE)
```

```
##        median          mean       SE.mean  CI.mean.0.95           var
##  4.000000e+00  3.487783e+00  6.920580e-02  1.362494e-01  1.302728e+00
##       std.dev      coef.var      skewness      skew.2SE      kurtosis
##  1.141371e+00  3.272483e-01 -4.135498e-01 -1.399854e+00 -1.511605e+00
##      kurt.2SE    normtest.W    normtest.p
## -2.567516e+00  8.459156e-01  9.036119e-16
```

```
shapiro.test(erupciones$eruptions)
```

```
##
##  Shapiro-Wilk normality test
##
## data:  erupciones$eruptions
## W = 0.84592, p-value = 9.036e-16
```

```
shapiro.test(erupciones$waiting)
```

```
##
##  Shapiro-Wilk normality test
##
## data:  erupciones$waiting
## W = 0.92215, p-value = 1.015e-10
```

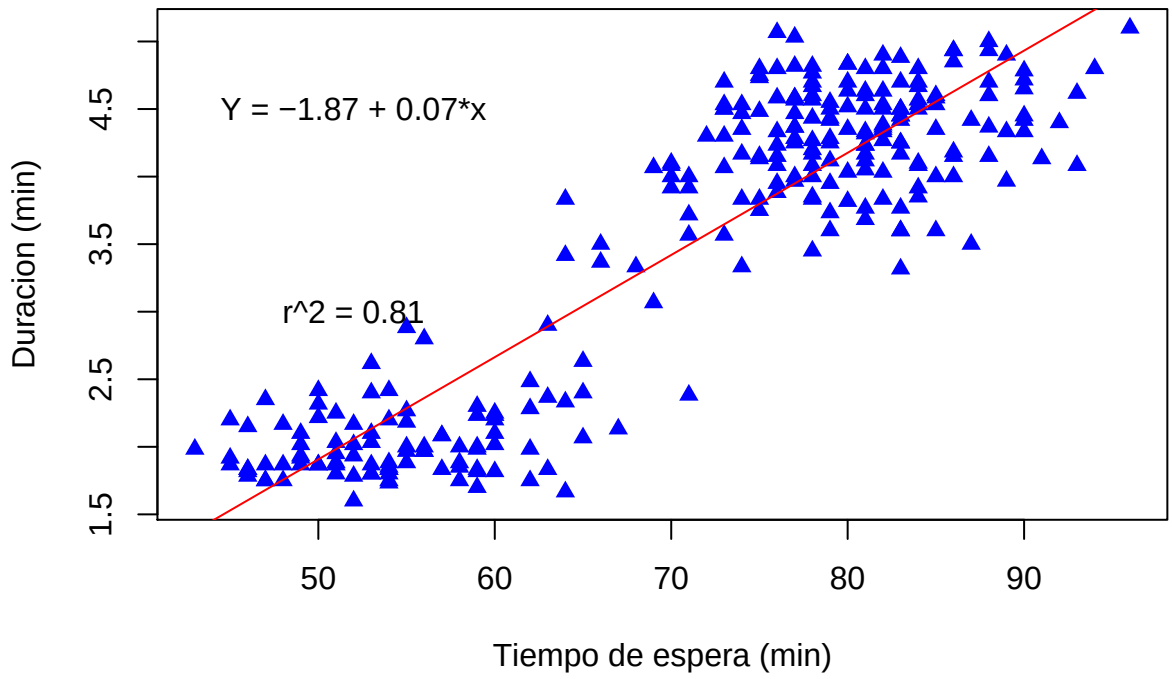
```
cor.test(erupciones$eruptions, erupciones$waiting)
```

```
##
```

```
##  Pearson's product-moment correlation
##
## data:  erupciones$eruptions and erupciones$waiting
## t = 34.089, df = 270, p-value < 2.2e-16
## alternative hypothesis: true correlation is not equal to 0
## 95 percent confidence interval:
##  0.8756964 0.9210652
## sample estimates:
##       cor
## 0.9008112
```

```
# Regresion lineal ------------------------------------------------------------

lm.erup <- lm(erupciones$eruptions ~ erupciones$waiting)
plot(erupciones$waiting, erupciones$eruptions, pch=17, col= "blue",
     xlab= "Tiempo de espera (min)",
     ylab= "Duracion (min)")
abline(lm.erup, col= "red")
text(52, 4.5, "Y = -1.87 + 0.07*x")
text(52, 3, "r^2 = 0.81")
```




```
lm.erup
```

```
##
## Call:
## lm(formula = erupciones$eruptions ~ erupciones$waiting)
##
```

```
## Coefficients:
##        (Intercept)  erupciones$waiting
##           -1.87402             0.07563
```

```
summary(lm.erup)
```

```
##
## Call:
## lm(formula = erupciones$eruptions ~ erupciones$waiting)
##
## Residuals:
##      Min       1Q   Median       3Q      Max
## -1.29917 -0.37689  0.03508  0.34909  1.19329
##
## Coefficients:
##                      Estimate Std. Error t value Pr(>|t|)
## (Intercept)        -1.874016   0.160143  -11.70   <2e-16 ***
## erupciones$waiting  0.075628   0.002219   34.09   <2e-16 ***
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 0.4965 on 270 degrees of freedom
## Multiple R-squared:  0.8115, Adjusted R-squared:  0.8108
## F-statistic:  1162 on 1 and 270 DF,  p-value: < 2.2e-16
```

```
length(erupciones$eruptions)
```

```
## [1] 272
```

```
y.60 <- -1.87 + 0.7*60
y.60
```

```
## [1] 40.13
```

```
# Datos de regresion ------------------------------------------------------

espera <- erupciones$waiting
duracion<-erupciones$eruptions
res <- resid(lm.erup)
pre <- fitted(lm.erup)
res.2 <-res^2

cuadro <- round(data.frame(espera,duracion,pre,res,res.2),4)

SSE <- sum(cuadro$res.2)
SSE
```

```
## [1] 66.5612
```

```
vari <- SSE/(length(erupciones$waiting)-2)
vari
```

```
## [1] 0.246523
```

```
# Prueba de hipotesis de la regresion -------------------------------------

an.erup <- anova(lm.erup)
an.erup
```

```
## Analysis of Variance Table
##
## Response: erupciones$eruptions
##                     Df  Sum Sq Mean Sq F value    Pr(>F)
## erupciones$waiting   1 286.478 286.478  1162.1 < 2.2e-16 ***
## Residuals          270  66.562   0.247
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
```

```
# Se acepta Ha la regresion se puede aplicar debido a < 2.2e-16
```