# UNIVERSIDAD AUTÓNOMA DE NUEVO LEÓN

# FACULTAD DE CIENCIAS FORESTALES

**TAREA SEIS**

**REGRESIÓN LINEAL**

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# Tarea06_EmanuelMolinaMarchan.R

Emanuel

2022-09-21

```
erup <- read.csv("erupcion.csv", header =T)
erup
```

```
##     eruptions waiting
## 1       3.600      79
## 2       1.800      54
## 3       3.333      74
## 4       2.283      62
## 5       4.533      85
## 6       2.883      55
## 7       4.700      88
## 8       3.600      85
## 9       1.950      51
## 10      4.350      85
## 11      1.833      54
## 12      3.917      84
## 13      4.200      78
## 14      1.750      47
## 15      4.700      83
## 16      2.167      52
## 17      1.750      62
## 18      4.800      84
## 19      1.600      52
## 20      4.250      79
## 21      1.800      51
## 22      1.750      47
## 23      3.450      78
## 24      3.067      69
## 25      4.533      74
## 26      3.600      83
## 27      1.967      55
## 28      4.083      76
## 29      3.850      78
## 30      4.433      79
## 31      4.300      73
## 32      4.467      77
## 33      3.367      66
## 34      4.033      80
## 35      3.833      74
## 36      2.017      52
## 37      1.867      48
## 38      4.833      80
## 39      1.833      59
## 40      4.783      90
```

```
## 41      4.350      80
## 42      1.883      58
## 43      4.567      84
## 44      1.750      58
## 45      4.533      73
## 46      3.317      83
## 47      3.833      64
## 48      2.100      53
## 49      4.633      82
## 50      2.000      59
## 51      4.800      75
## 52      4.716      90
## 53      1.833      54
## 54      4.833      80
## 55      1.733      54
## 56      4.883      83
## 57      3.717      71
## 58      1.667      64
## 59      4.567      77
## 60      4.317      81
## 61      2.233      59
## 62      4.500      84
## 63      1.750      48
## 64      4.800      82
## 65      1.817      60
## 66      4.400      92
## 67      4.167      78
## 68      4.700      78
## 69      2.067      65
## 70      4.700      73
## 71      4.033      82
## 72      1.967      56
## 73      4.500      79
## 74      4.000      71
## 75      1.983      62
## 76      5.067      76
## 77      2.017      60
## 78      4.567      78
## 79      3.883      76
## 80      3.600      83
## 81      4.133      75
## 82      4.333      82
## 83      4.100      70
## 84      2.633      65
## 85      4.067      73
## 86      4.933      88
## 87      3.950      76
## 88      4.517      80
## 89      2.167      48
## 90      4.000      86
```

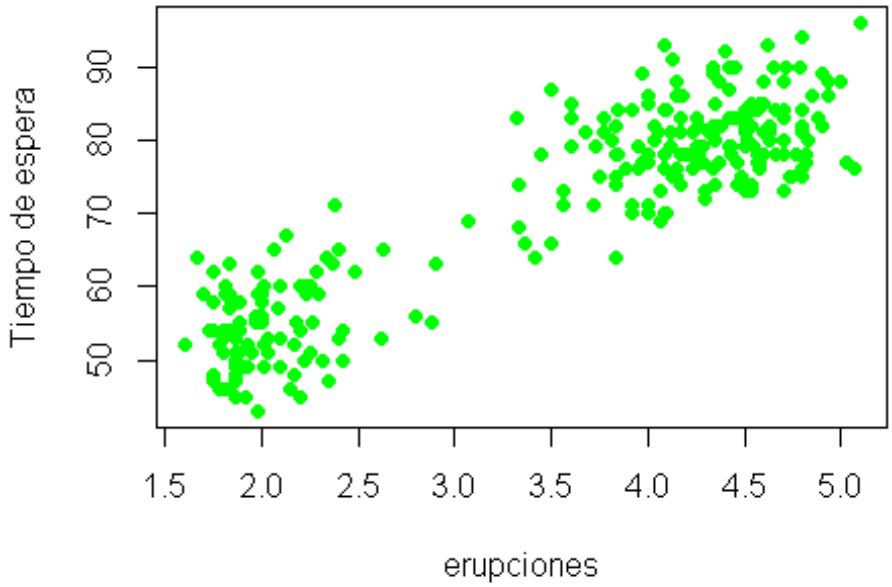
```
## 91      2.200      60
## 92      4.333      90
## 93      1.867      50
## 94      4.817      78
## 95      1.833      63
## 96      4.300      72
## 97      4.667      84
## 98      3.750      75
## 99      1.867      51
## 100     4.900      82
## 101     2.483      62
## 102     4.367      88
## 103     2.100      49
## 104     4.500      83
## 105     4.050      81
## 106     1.867      47
## 107     4.700      84
## 108     1.783      52
## 109     4.850      86
## 110     3.683      81
## 111     4.733      75
## 112     2.300      59
## 113     4.900      89
## 114     4.417      79
## 115     1.700      59
## 116     4.633      81
## 117     2.317      50
## 118     4.600      85
## 119     1.817      59
## 120     4.417      87
## 121     2.617      53
## 122     4.067      69
## 123     4.250      77
## 124     1.967      56
## 125     4.600      88
## 126     3.767      81
## 127     1.917      45
## 128     4.500      82
## 129     2.267      55
## 130     4.650      90
## 131     1.867      45
## 132     4.167      83
## 133     2.800      56
## 134     4.333      89
## 135     1.833      46
## 136     4.383      82
## 137     1.883      51
## 138     4.933      86
## 139     2.033      53
## 140     3.733      79
```

```
## 141     4.233      81
## 142     2.233      60
## 143     4.533      82
## 144     4.817      77
## 145     4.333      76
## 146     1.983      59
## 147     4.633      80
## 148     2.017      49
## 149     5.100      96
## 150     1.800      53
## 151     5.033      77
## 152     4.000      77
## 153     2.400      65
## 154     4.600      81
## 155     3.567      71
## 156     4.000      70
## 157     4.500      81
## 158     4.083      93
## 159     1.800      53
## 160     3.967      89
## 161     2.200      45
## 162     4.150      86
## 163     2.000      58
## 164     3.833      78
## 165     3.500      66
## 166     4.583      76
## 167     2.367      63
## 168     5.000      88
## 169     1.933      52
## 170     4.617      93
## 171     1.917      49
## 172     2.083      57
## 173     4.583      77
## 174     3.333      68
## 175     4.167      81
## 176     4.333      81
## 177     4.500      73
## 178     2.417      50
## 179     4.000      85
## 180     4.167      74
## 181     1.883      55
## 182     4.583      77
## 183     4.250      83
## 184     3.767      83
## 185     2.033      51
## 186     4.433      78
## 187     4.083      84
## 188     1.833      46
## 189     4.417      83
## 190     2.183      55
```

```
## 191     4.800      81
## 192     1.833      57
## 193     4.800      76
## 194     4.100      84
## 195     3.966      77
## 196     4.233      81
## 197     3.500      87
## 198     4.366      77
## 199     2.250      51
## 200     4.667      78
## 201     2.100      60
## 202     4.350      82
## 203     4.133      91
## 204     1.867      53
## 205     4.600      78
## 206     1.783      46
## 207     4.367      77
## 208     3.850      84
## 209     1.933      49
## 210     4.500      83
## 211     2.383      71
## 212     4.700      80
## 213     1.867      49
## 214     3.833      75
## 215     3.417      64
## 216     4.233      76
## 217     2.400      53
## 218     4.800      94
## 219     2.000      55
## 220     4.150      76
## 221     1.867      50
## 222     4.267      82
## 223     1.750      54
## 224     4.483      75
## 225     4.000      78
## 226     4.117      79
## 227     4.083      78
## 228     4.267      78
## 229     3.917      70
## 230     4.550      79
## 231     4.083      70
## 232     2.417      54
## 233     4.183      86
## 234     2.217      50
## 235     4.450      90
## 236     1.883      54
## 237     1.850      54
## 238     4.283      77
## 239     3.950      79
## 240     2.333      64
```

```
## 241     4.150      75
## 242     2.350      47
## 243     4.933      86
## 244     2.900      63
## 245     4.583      85
## 246     3.833      82
## 247     2.083      57
## 248     4.367      82
## 249     2.133      67
## 250     4.350      74
## 251     2.200      54
## 252     4.450      83
## 253     3.567      73
## 254     4.500      73
## 255     4.150      88
## 256     3.817      80
## 257     3.917      71
## 258     4.450      83
## 259     2.000      56
## 260     4.283      79
## 261     4.767      78
## 262     4.533      84
## 263     1.850      58
## 264     4.250      83
## 265     1.983      43
## 266     2.250      60
## 267     4.750      75
## 268     4.117      81
## 269     2.150      46
## 270     4.417      90
## 271     1.817      46
## 272     4.467      74
```

```
plot(erup$eruptions, erup$waiting,
     pch=19, col="green",
     xlab= "erupciones",
     ylab= "Tiempo de espera")
```




```
mean(erup$eruptions)
```

```
## [1] 3.487783
```

```
mean(erup$waiting)
```

```
## [1] 70.89706
```

```
sd(erup$eruptions)
```

```
## [1] 1.141371
```

```
sd(erup$waiting)
```

```
## [1] 13.59497
```

```
var(erup$eruptions)
```

```
## [1] 1.302728
```

```
var(erup$waiting)
```

```
## [1] 184.8233
```

```
cor.ar <- cor.test(erup$eruptions, erup$waiting)
cor.ar
```

```
##
##  Pearson's product-moment correlation
##
```

```
## data:  erup$eruptions and erup$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
```

```
# r = coef. cor = 0.9008112
# Si existe una correlacion significativa entre ambas variables

# H0: No existe una correlación significativa entre la erupcion  y el tie
mpo de espera
# H1: Existe una correlación significativa entre la erupcion y el tiempo
de espera
```

```
erup.lm <- lm(erup$eruptions  ~  erup$waiting)

erup.lm
```

```
##
## Call:
## lm(formula = erup$eruptions ~ erup$waiting)
##
## Coefficients:
##  (Intercept)  erup$waiting
##     -1.87402       0.07563
```

```
#valor de α = -1.87402
#valor de β = 0.07563

summary(erup.lm)
```

```
##
## Call:
## lm(formula = erup$eruptions ~ erup$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 ***
## erup$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

# p-value: < 2.2e-16, sí es significativo

sum(erup.lm$residuals)

## [1] 6.973588e-16

#  α y β son altamente significativas y ambas son significativas al model
o de regresion


-1.874016 + (0.075628*80)

## [1] 4.176224

-1.874016 + (0.075628*40)

## [1] 1.151104

-1.874016 + (0.075628*45)

## [1] 1.529244

-1.874016 + (0.075628*53)

## [1] 2.134268

-1.874016 + (0.075628*61)

## [1] 2.739292
```