

**UNIVERSIDAD AUTÓNOMA DE NUEVO LEÓN**

**FACULTAD DE CIENCIAS FORESTALES**

**TAREA SEIS**

**REGRESIÓN LINEAL**

**EMANUEL MOLINA MARCHAN**

**MATRÍCULA**

**2134498**

**SEPTIEMBRE, 2022**

Tarea06\_EmanuelMolinaMarchan.R

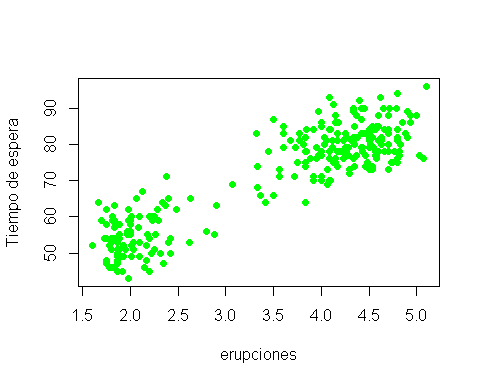
Emanuel

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 tiempo 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 modelo 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