

Clase-5.R

Usuario

2019-08-09

```
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#09/Agosto/2019  
#Clase 5
```

```
# ANOVA -----
```

```
arena <- c(6,10,8,6,14,17,9,11,7,11)  
arcilla <- c(17,15,3,11,14,12,12,8,10,13)  
limo<- c(13,16,9,12,15,16,17,13,18,14)  
  
y.ton <- c(arena, arcilla, limo)  
suelo<- gl(3,10,30, labels=c("arena","arcilla","limo"))  
prod<- data.frame(suelo, y.ton)  
head(prod)
```

```
##      suelo y.ton  
## 1 arena      6  
## 2 arena     10  
## 3 arena      8  
## 4 arena      6  
## 5 arena     14  
## 6 arena     17
```

```
tapply(prod$y.ton, prod$suelo, mean)
```

```
##      arena arcilla      limo  
##      9.9      11.5      14.3
```

```
tapply(prod$y.ton, prod$suelo, var)
```

```
##      arena      arcilla      limo  
## 12.544444 15.388889  7.122222
```

```
shapiro.test(prod$y.ton)
```

```
##  
##  Shapiro-Wilk normality test  
##  
## data:  prod$y.ton  
## W = 0.97214, p-value = 0.5993
```

```
bartlett.test(prod$y.ton, prod$suelo)
```

```
##  
##  Bartlett test of homogeneity of variances  
##  
## data:  prod$y.ton and prod$suelo  
## Bartlett's K-squared = 1.2764, df = 2, p-value = 0.5283
```

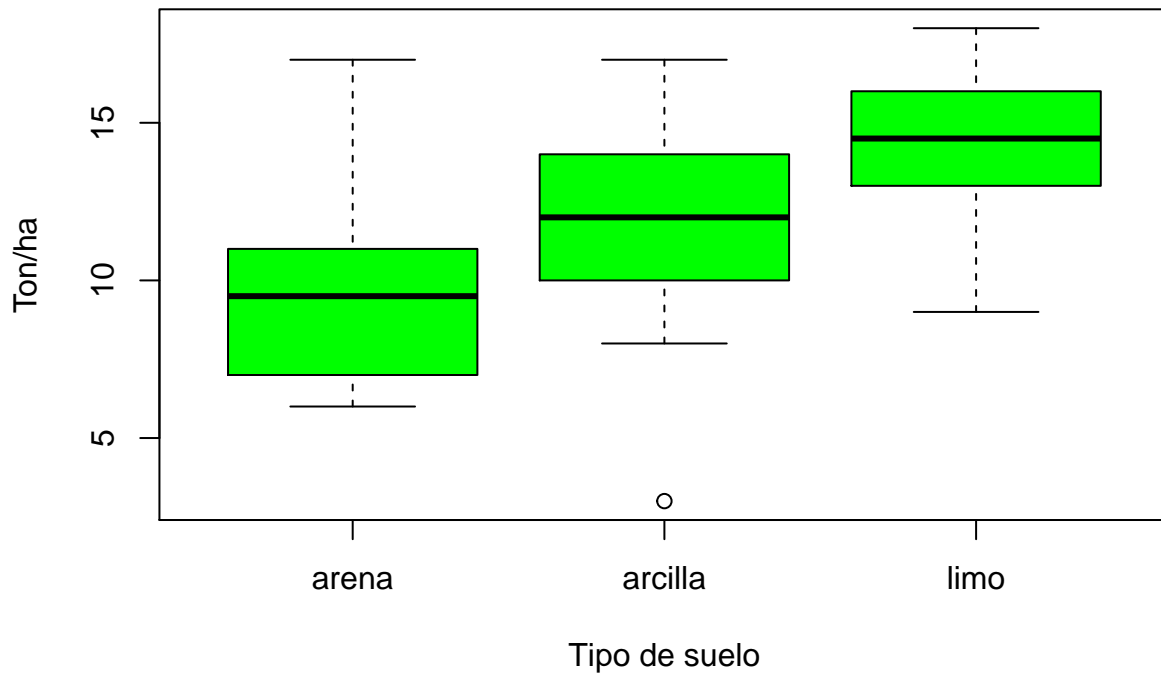
```

fligner.test(prod$y.ton, prod$suelo)

##
##  Fligner-Killeen test of homogeneity of variances
##
## data:  prod$y.ton and prod$suelo
## Fligner-Killeen:med chi-squared = 0.36507, df = 2, p-value =
## 0.8332

boxplot(prod$y.ton ~ prod$suelo, xlab = "Tipo de suelo",
        ylab= "Ton/ha", col="green")

```



```

aovsuelo<- aov(prod$y.ton ~ prod$suelo)
aovsuelo

## Call:
##  aov(formula = prod$y.ton ~ prod$suelo)
##
## Terms:
##               prod$suelo Residuals
## Sum of Squares      99.2      315.5
## Deg. of Freedom       2        27
##
## Residual standard error: 3.41836
## Estimated effects may be unbalanced

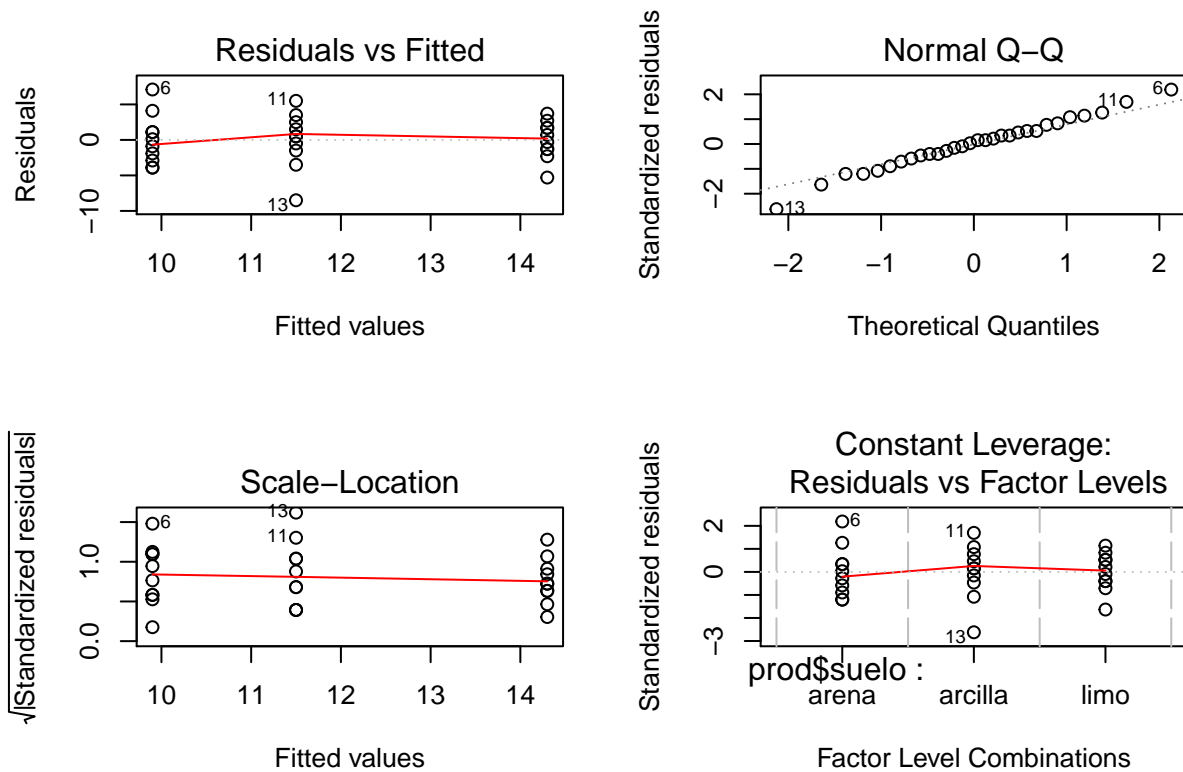
```

```
summary(aovsuelo)
```

```
##              Df Sum Sq Mean Sq F value Pr(>F)
## prod$suelo    2   99.2   49.60   4.245  0.025 *
## Residuals    27  315.5   11.69
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
```

```
par(mfrow=c(2,2))
```

```
plot(aov(prod$y.ton~prod$suelo))
```



```
par(mfrow=c(2,2))
```

```
TukeyHSD(aovsuelo, conf.level = 0.95)
```

```
## Tukey multiple comparisons of means
## 95% family-wise confidence level
##
## Fit: aov(formula = prod$y.ton ~ prod$suelo)
##
## $`prod$suelo`
##              diff          lwr          upr          p adj
## arcilla-arena  1.6 -2.1903777  5.390378  0.5546301
## limo-arena     4.4  0.6096223  8.190378  0.0204414
## limo-arcilla   2.8 -0.9903777  6.590378  0.1785489
```

```
plot(TukeyHSD(aovsuelo))
```

95% family-wise confidence level

