Examen-ANOVA.R

Usuario1

2024-12-04

```
#EXAMEN FINAL ANOVA
#04/12/2024
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#DATOS POR GRUPO
fertilizante_A <- c(12, 15, 14, 10, 13, 11, 16, 12, 14, 13, 12, 15, 14,
10, 11)
fertilizante_B <- c(20, 22, 19, 21, 23, 22, 20, 19, 21, 20, 22, 23, 19,
21, 22)
fertilizante_C <- c(16, 17, 18, 15, 14, 16, 17, 18, 15, 14, 16, 17, 18,
15, 14)
planta <- seq_along(1:45)

#CREAR EL DATA FRAME
datos <- data.frame(planta = planta, tiempo = c(fertilizante_A,
fertilizante_B, fertilizante_C), fertilizante = factor(rep
(c("FA", "FB", "FC"), each = 15)))
head(datos)

##   planta tiempo fertilizante
## 1      1     12           FA
## 2      2     15           FA
## 3      3     14           FA
## 4      4     10           FA
## 5      5     13           FA
## 6      6     11           FA

tapply(datos$tiempo, datos$fertilizante, mean)

##       FA       FB       FC
## 12.80000 20.93333 16.00000

tapply(datos$tiempo, datos$fertilizante, var)

##       FA       FB       FC
## 3.457143 1.923810 2.142857

shapiro.test(datos$tiempo)

##
##  Shapiro-Wilk normality test
##
```
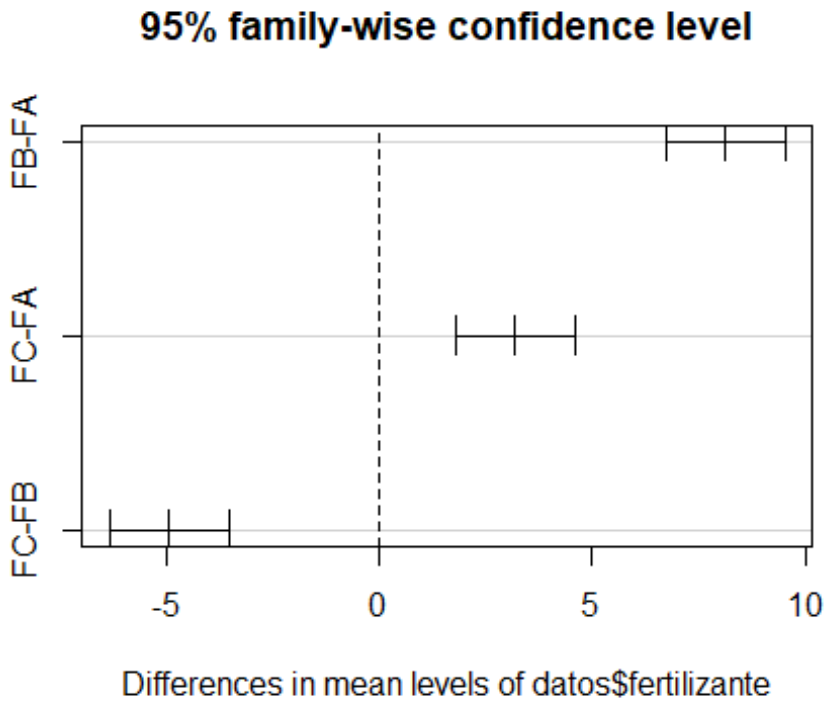

```
## data:  datos$tiempo
## W = 0.9588, p-value = 0.1099

bartlett.test(datos$tiempo ~ datos$fertilizante)

##
##  Bartlett test of homogeneity of variances
##
## data:  datos$tiempo by datos$fertilizante
## Bartlett's K-squared = 1.3772, df = 2, p-value = 0.5023

par.aov <- aov(datos$tiempo ~ datos$fertilizante)
summary(par.aov)

##                     Df Sum Sq Mean Sq F value Pr(>F)
## datos$fertilizante  2  503.6  251.82   100.4 <2e-16 ***
## Residuals          42  105.3    2.51
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

TukeyHSD(par.aov)

##   Tukey multiple comparisons of means
##     95% family-wise confidence level
##
## Fit: aov(formula = datos$tiempo ~ datos$fertilizante)
##
## $`datos$fertilizante`
##            diff       lwr       upr   p adj
## FB-FA  8.133333  6.728440  9.538227 0.0e+00
## FC-FA  3.200000  1.795106  4.604894 5.5e-06
## FC-FB -4.933333 -6.338227 -3.528440 0.0e+00

plot(TukeyHSD(par.aov))
```


95% family-wise confidence level
FB-FA
FC-FA
FC-FB
-5
0
5
10
Differences in mean levels of datos$fertilizante