

Anova un facteur. Plant Growth

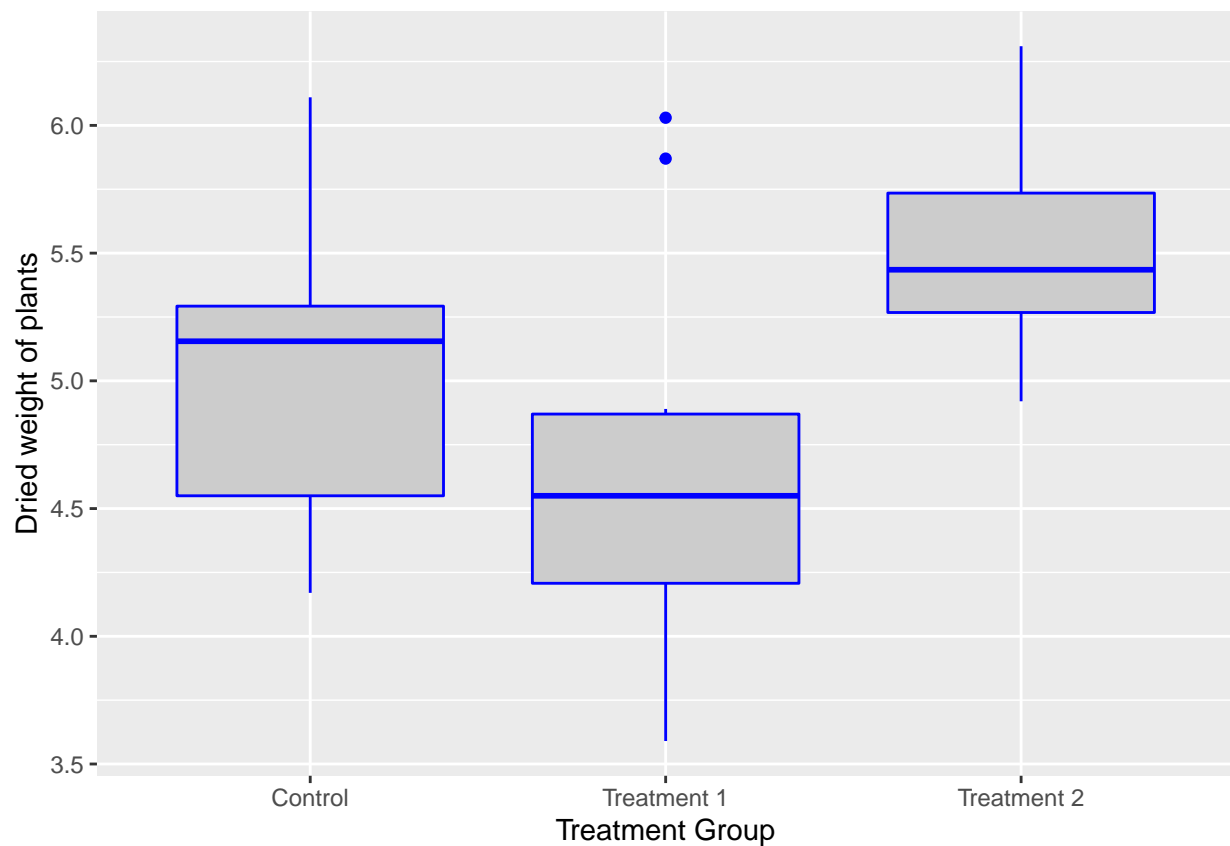
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```
rm(list=ls())
plant.df = PlantGrowth
plant.df$group = factor(plant.df$group, labels = c("Control", "Treatment 1", "Treatment 2"))
table(plant.df$group)
```

```
##
##      Control Treatment 1 Treatment 2
##          10           10           10
```

```
ggplot(plant.df, aes(x = group, y = weight)) +
  geom_boxplot(fill = "grey80", colour = "blue") +
  scale_x_discrete() + xlab("Treatment Group") +
  ylab("Dried weight of plants")
```

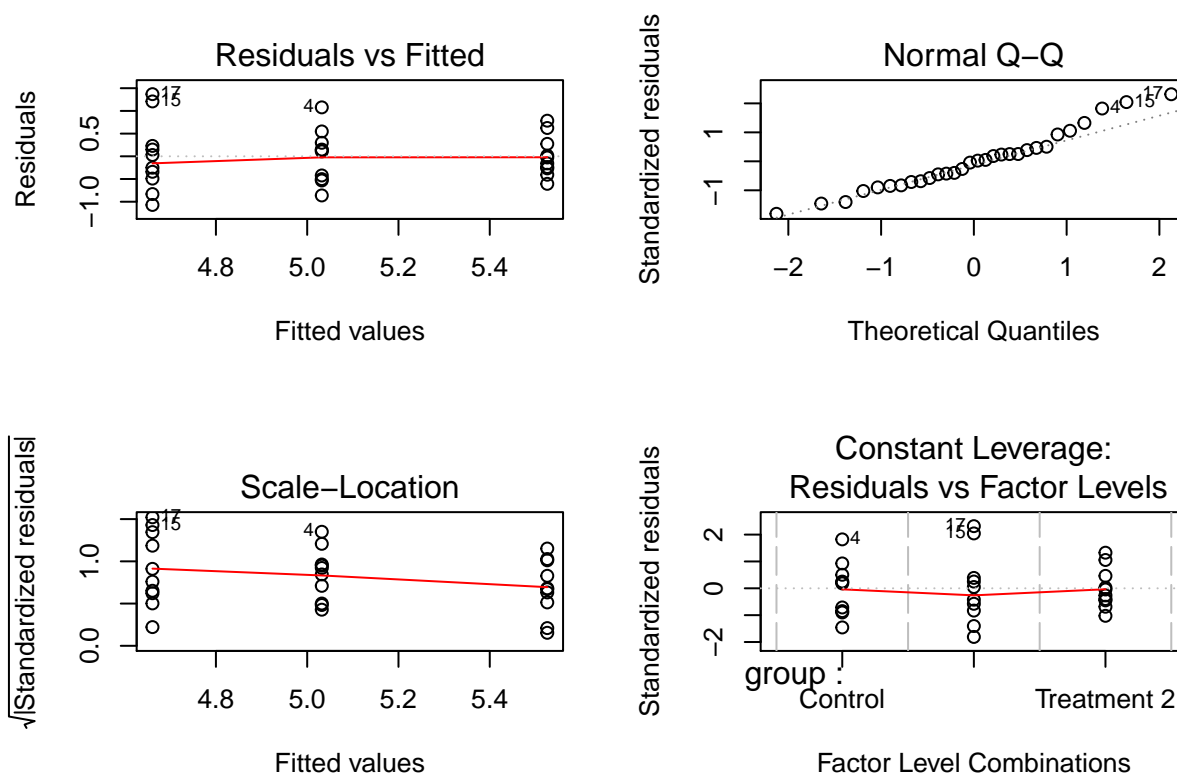


```
plant.mod1 = lm(weight ~ group, data = plant.df)
summary(plant.mod1)
```

```
##
## Call:
## lm(formula = weight ~ group, data = plant.df)
```

```
##
## Residuals:
##      Min       1Q   Median       3Q      Max
## -1.0710 -0.4180 -0.0060  0.2627  1.3690
##
## Coefficients:
##              Estimate Std. Error t value Pr(>|t|)
## (Intercept)      5.0320     0.1971  25.527 <2e-16 ***
## groupTreatment 1  -0.3710     0.2788  -1.331  0.1944
## groupTreatment 2   0.4940     0.2788   1.772  0.0877 .
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 0.6234 on 27 degrees of freedom
## Multiple R-squared:  0.2641, Adjusted R-squared:  0.2096
## F-statistic: 4.846 on 2 and 27 DF,  p-value: 0.01591
```

```
par(mfrow=c(2,2))
plot(plant.mod1)
```



```
contrasts(plant.df$group) <- contr.sum
plant.mod2 = lm(weight ~ group, data = plant.df)
summary(plant.mod2)
```

```
##
## Call:
## lm(formula = weight ~ group, data = plant.df)
```

```
##
## Residuals:
##      Min       1Q   Median       3Q      Max
## -1.0710 -0.4180 -0.0060  0.2627  1.3690
##
## Coefficients:
##              Estimate Std. Error t value Pr(>|t|)
## (Intercept)   5.0730     0.1138  44.573  <2e-16 ***
## group1       -0.0410     0.1610  -0.255  0.8009
## group2       -0.4120     0.1610  -2.560  0.0164 *
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 0.6234 on 27 degrees of freedom
## Multiple R-squared:  0.2641, Adjusted R-squared:  0.2096
## F-statistic: 4.846 on 2 and 27 DF,  p-value: 0.01591
anova(plant.mod1)

## Analysis of Variance Table
##
## Response: weight
##           Df Sum Sq Mean Sq F value Pr(>F)
## group      2  3.7663  1.8832  4.8461 0.01591 *
## Residuals 27 10.4921  0.3886
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
test.treatment = pairwise.t.test(plant.df$weight,plant.df$group,p.adjust.method="bonferroni")
test.treatment

##
## Pairwise comparisons using t tests with pooled SD
##
## data:  plant.df$weight and plant.df$group
##
##           Control Treatment 1
## Treatment 1 0.583      -
## Treatment 2 0.263      0.013
##
## P value adjustment method: bonferroni
```