Multiple Comparison Procedures To A Control

For AN(C)OVA Models

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Basic Information

Automatic statistics for the file:

File
litter.csv

Your selection for the encoding: UTF-8
Your selection for the decimal character: .
Observations (rows with at least one non-missing value): 74
Variables (columns with at least one non-missing value): 4
Variables considered continuous: 2

Variables considered continuous
weight
number

Variables considered categorical: 2

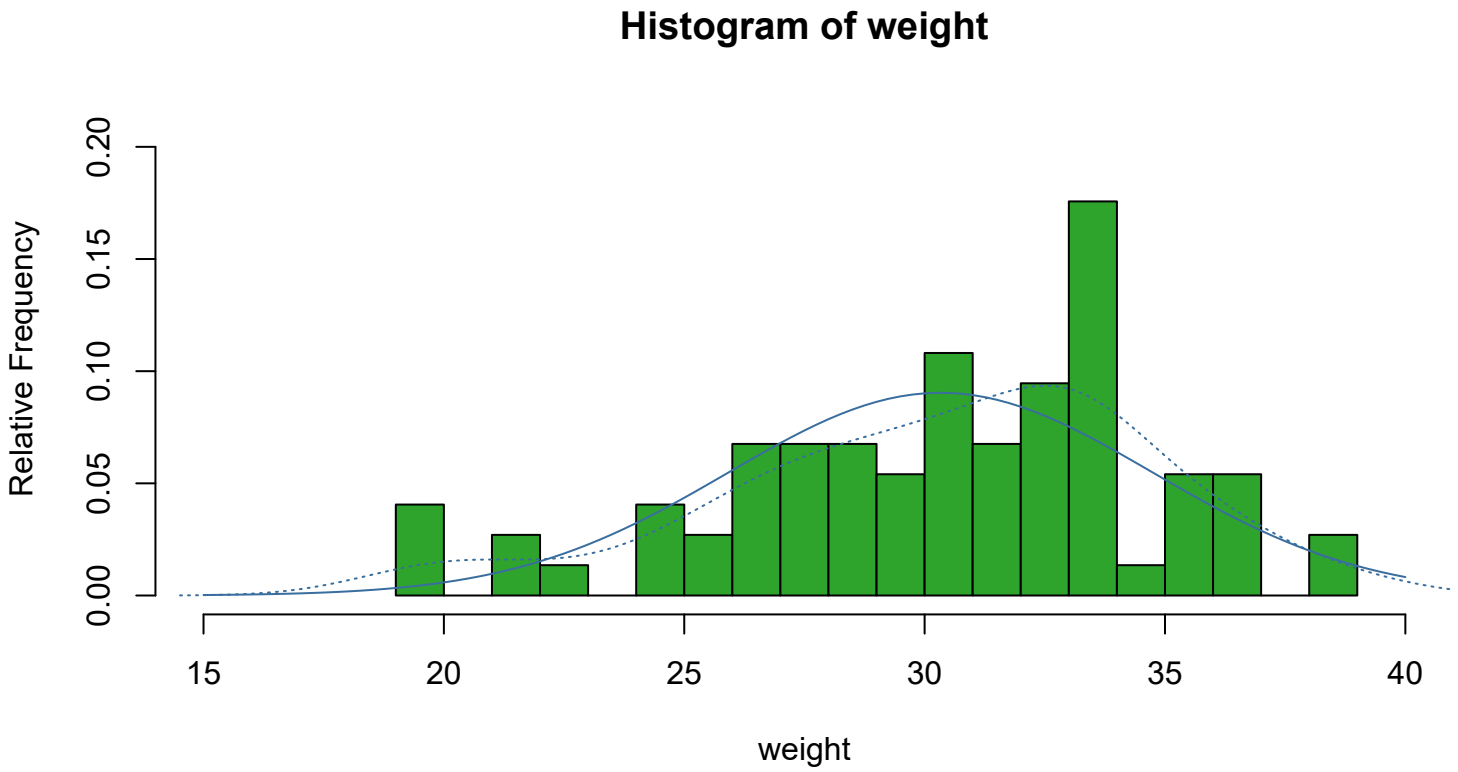
Variables considered categorical
dose
gesttime

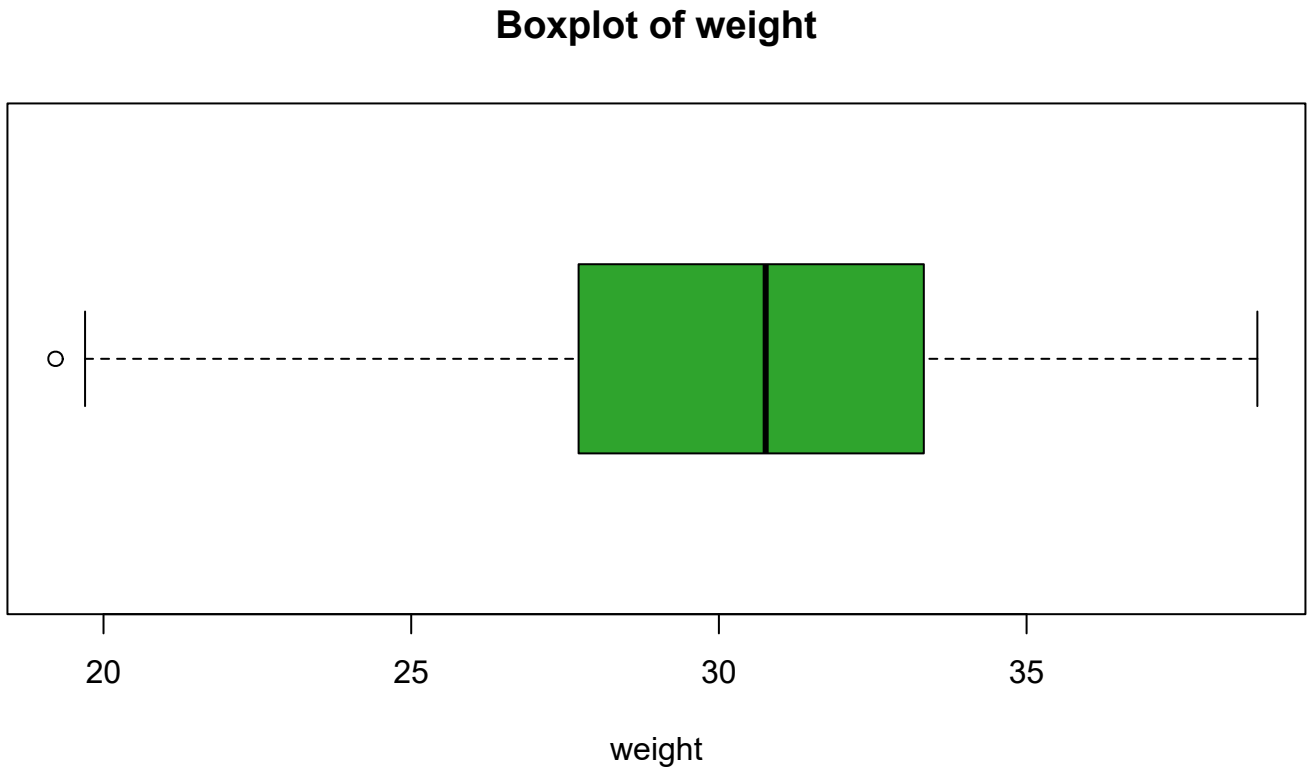
Model Information

You defined the following linear model: weight~dose+gesttime+number
You are interested in the factor: dose
You are interested in pairwise comparisons to the control factor level: 0

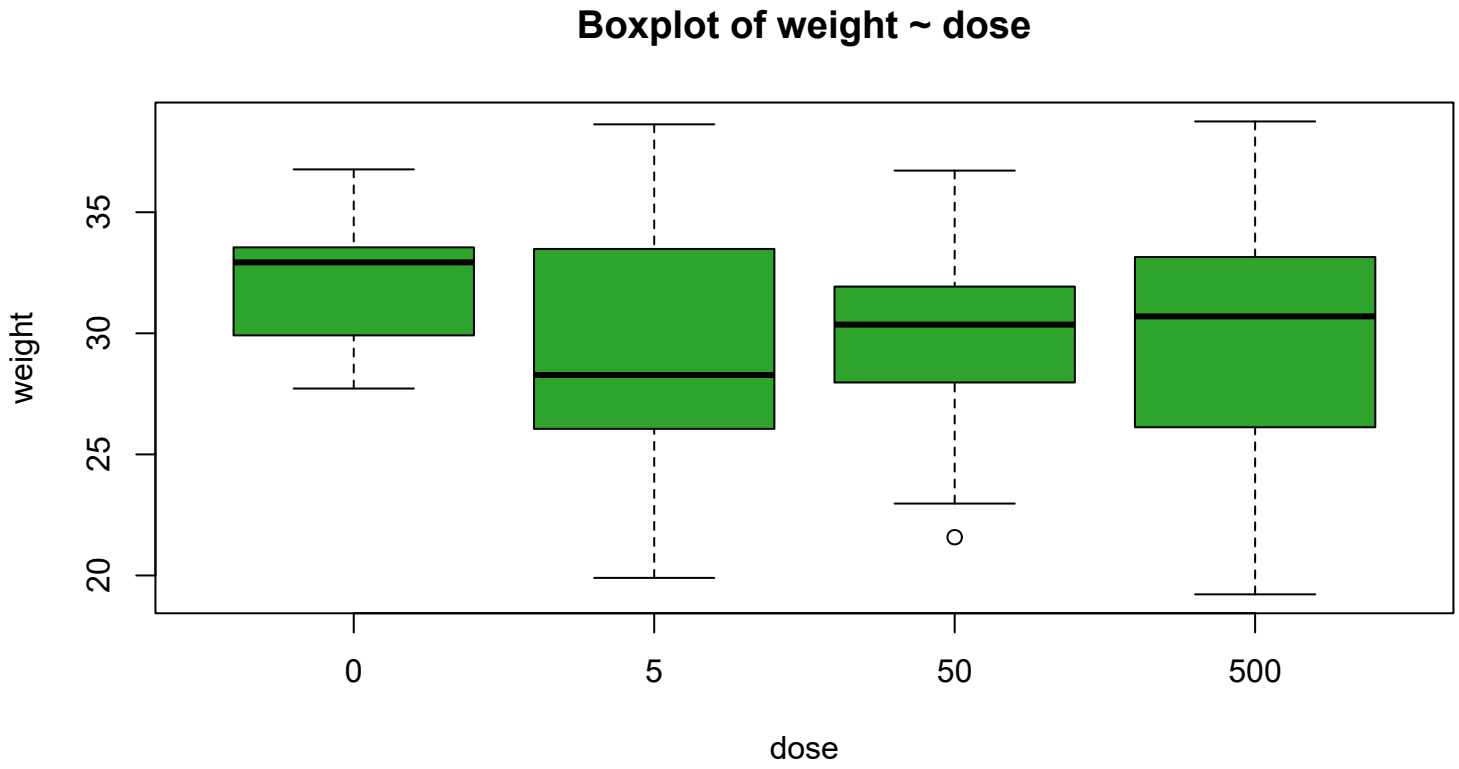
Descriptive Plots

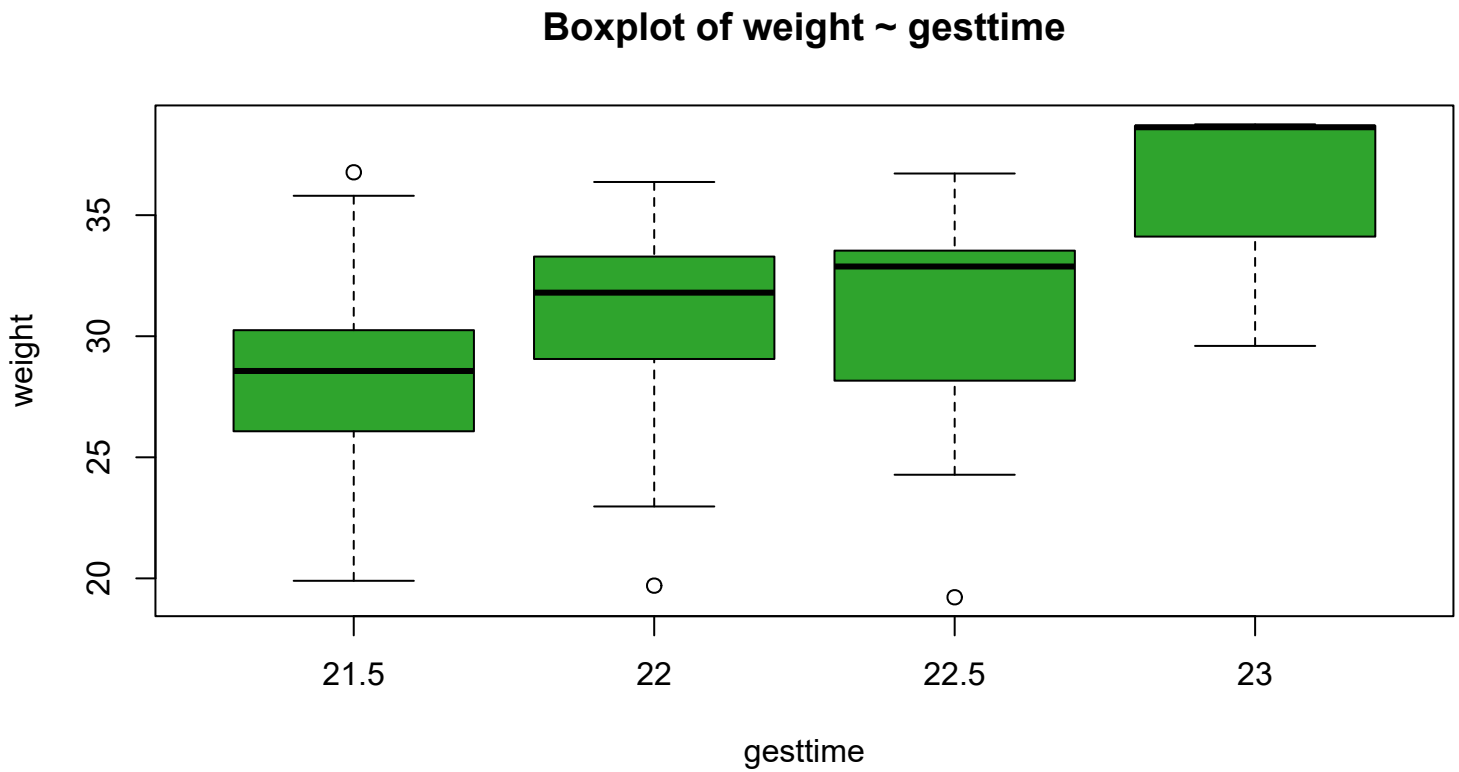
Dependent Variable



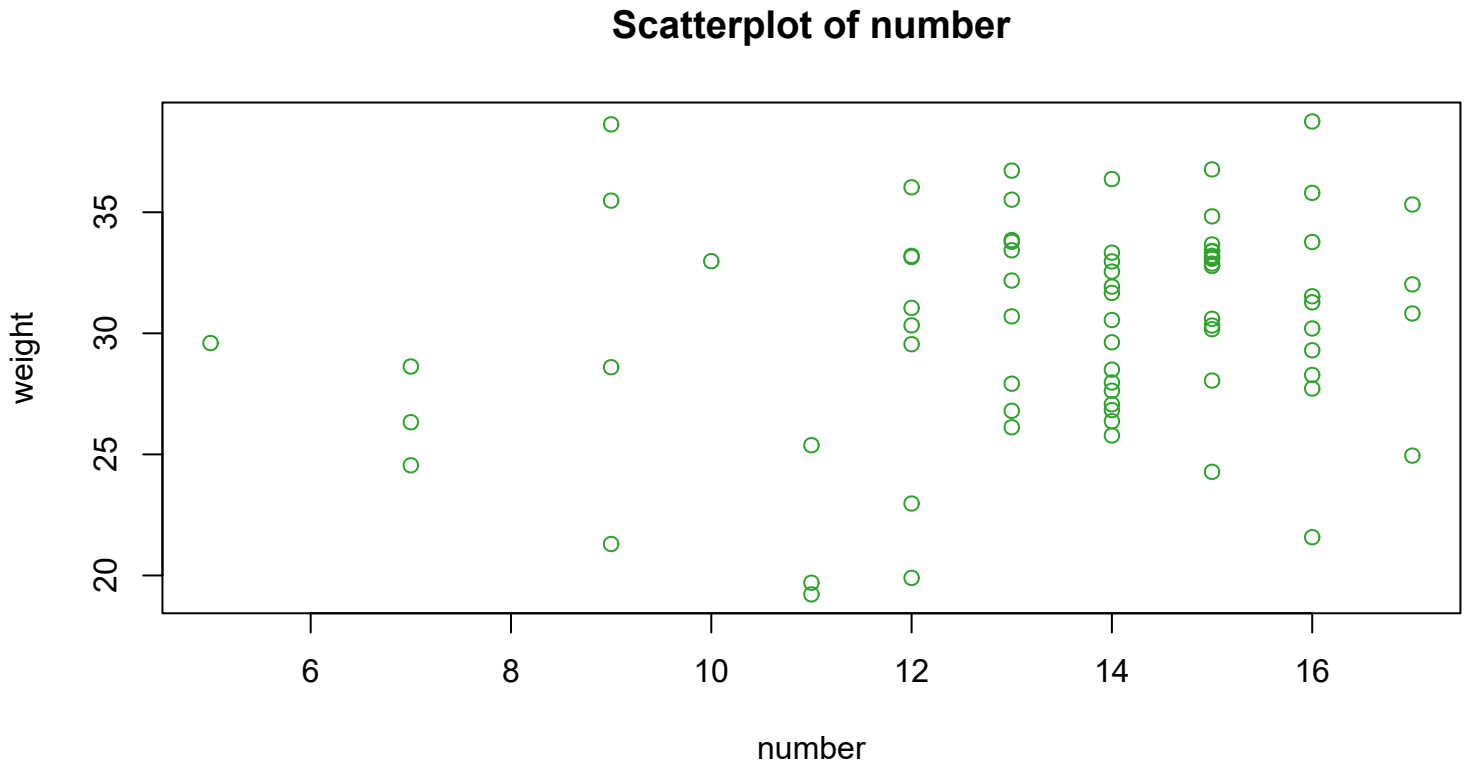

Boxplot of weight
20
25
30
35
weight

Dependent Against Categorical Factors



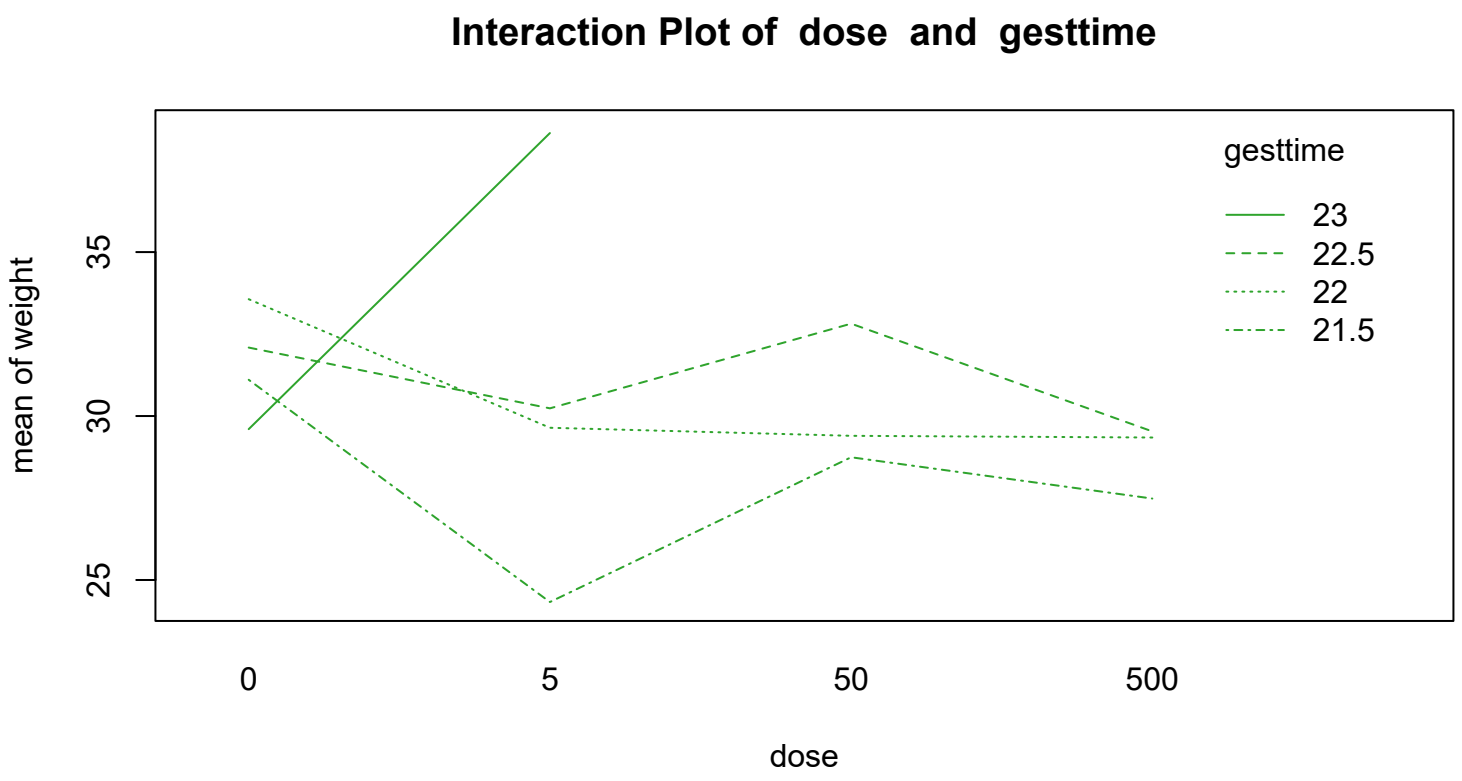

Boxplot of weight ~ gesttime
weight
20
25
30
35
21.5
22
22.5
23
gesttime

Dependent against Covariates



Interaction Plot for Factors

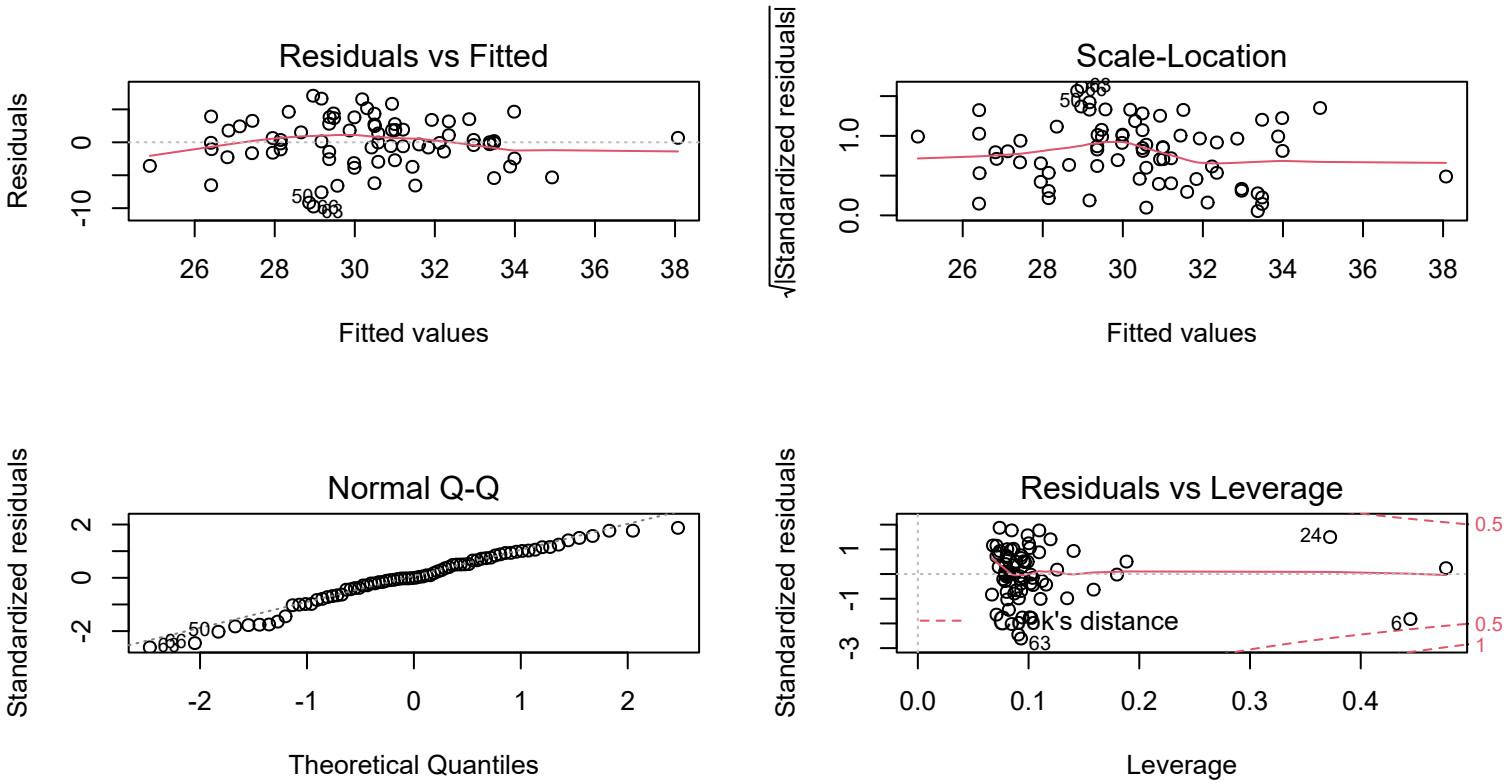
Note: The more parallel the lines, the less likely is the significance of the interaction of the factors.




```
Anova Table (Type III tests)

Response: weight
             Sum Sq Df F value    Pr(>F)
(Intercept) 1017.34  1 66.2027 1.509e-11 ***
dose         100.40  3  2.1778  0.098906 .
gesttime     226.18  3  4.9062  0.003874 **
number       102.89  1  6.6954  0.011875 *
```

```
Residuals   1014.23 66
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
```




```
     Simultaneous Tests for General Linear Hypotheses

Multiple Comparisons of Means: Dunnett Contrasts


Fit: lm(formula = modelfunction, data = df_factorized)

Linear Hypotheses:
```

```
             Estimate Std. Error t value Pr(<t)
5 - 0 >= 0     -2.988      1.282  -2.331 0.0306 *
50 - 0 >= 0    -2.273      1.316  -1.728 0.1089
500 - 0 >= 0   -2.468      1.312  -1.881 0.0811 .
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
(Adjusted p values reported -- single-step method)
```

```
     Simultaneous Confidence Intervals

Multiple Comparisons of Means: Dunnett Contrasts


Fit: lm(formula = modelfunction, data = df_factorized)

Quantile = 2.1139
95% family-wise confidence level


Linear Hypotheses:
             Estimate lwr     upr
5 - 0 >= 0   -2.9883     -Inf -0.2789
50 - 0 >= 0  -2.2729     -Inf  0.5079
500 - 0 >= 0 -2.4681     -Inf  0.3055
```

References

Fox, John, and Sanford Weisberg. 2019. *An R Companion to Applied Regression*. Third. Thousand Oaks CA: Sage. https://socialsciences.mcmaster.ca/jfox/Books/Companion/.

Gross, Juergen, and Uwe Ligges. 2015. *Nortest: Tests for Normality*. https://CRAN.R-project.org/package=nortest.

Madsen, Jacob H. 2018. *DDoutlier: Distance & Density-Based Outlier Detection*. https://CRAN.R-project.org/package=DDoutlier.

R Core Team. 2019. *R: A Language and Environment for Statistical Computing*. Vienna, Austria: R Foundation for Statistical Computing. https://www.R-project.org/.

Zeileis, Achim, and Torsten Hothorn. 2002. "Diagnostic Checking in Regression Relationships." *R News* 2 (3): 7–10. https://CRAN.R-project.org/doc/Rnews/.