

# Multiple Comparison Procedures To A Control

## For AN(C)OVA Models

Statsomat.com

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## Basic Information

Automatic statistics for the file:

File
recovery.csv

Your selection for the encoding: UTF-8

Your selection for the decimal character: .

Observations (rows with at least one non-missing value): 41

Variables (columns with at least one non-missing value): 2

Variables considered continuous: 1

Variables considered continuous
---------------------------------

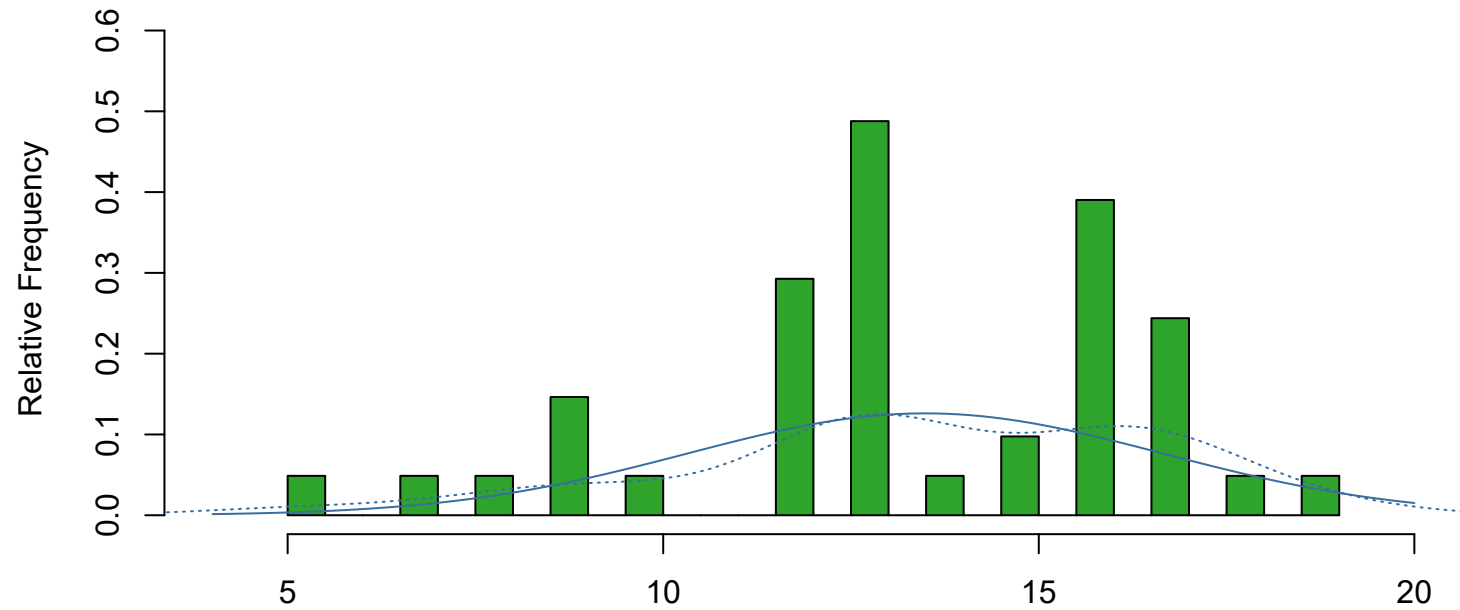
Variables considered categorical: 1

Variables considered categorical
blanket

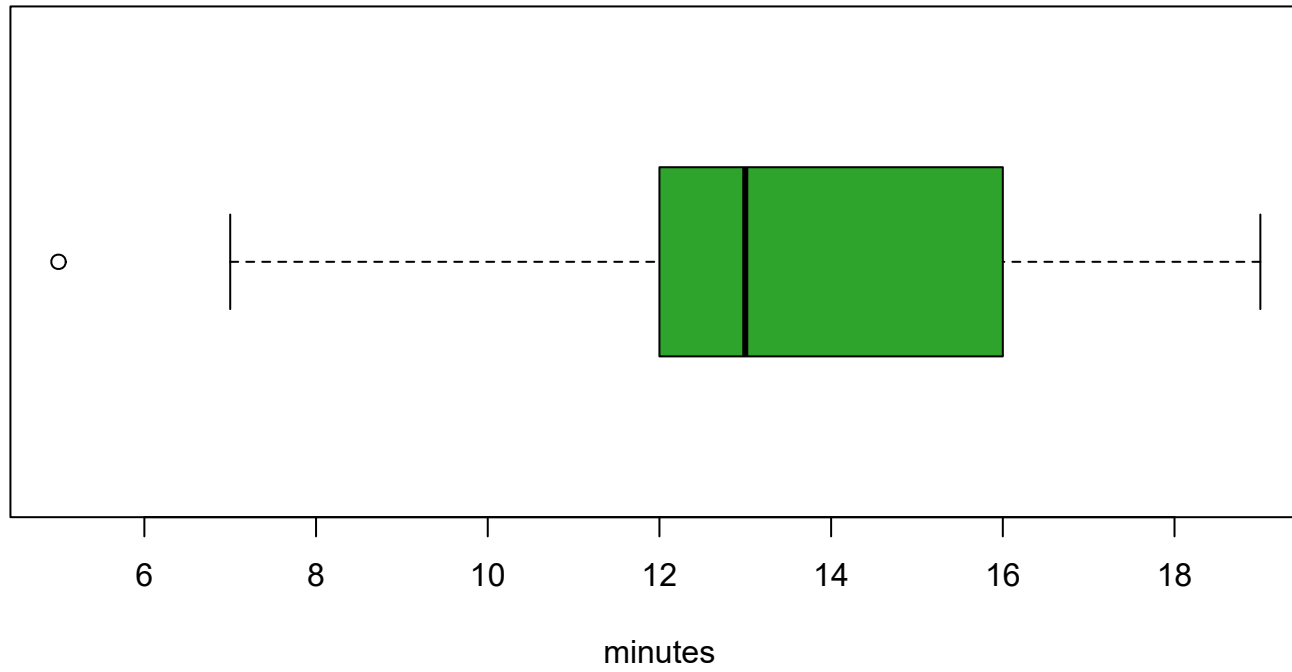
## Descriptive Plots

Histogram and Boxplot for dependent Variable

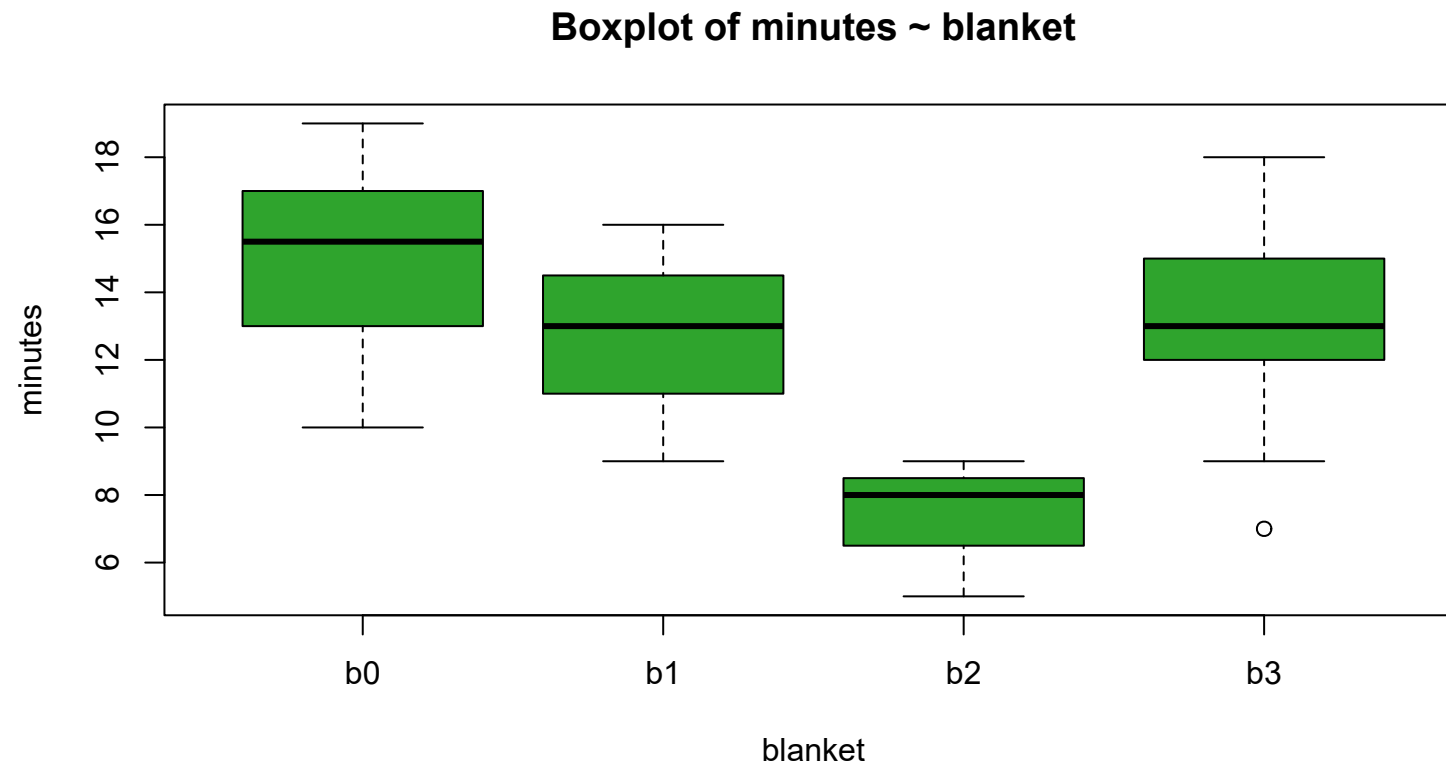
**Histogram of minutes**



**Boxplot of minutes**



Boxplot for categorical independent Variables



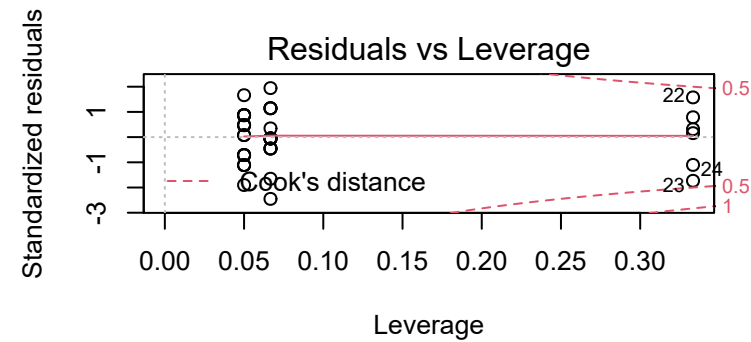
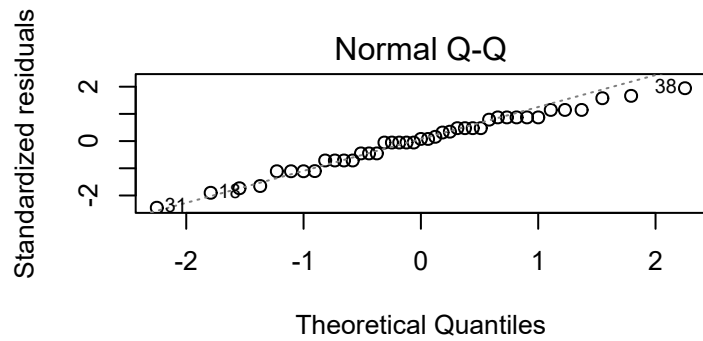
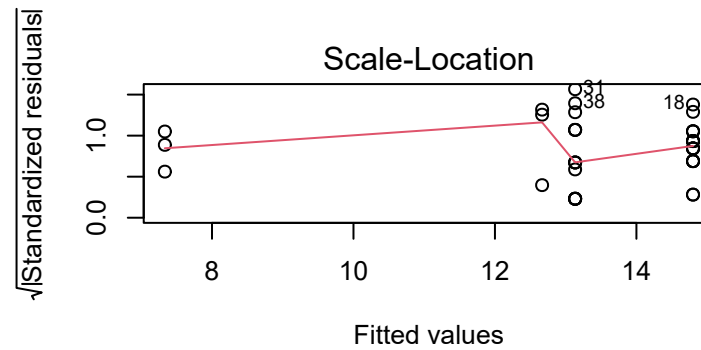
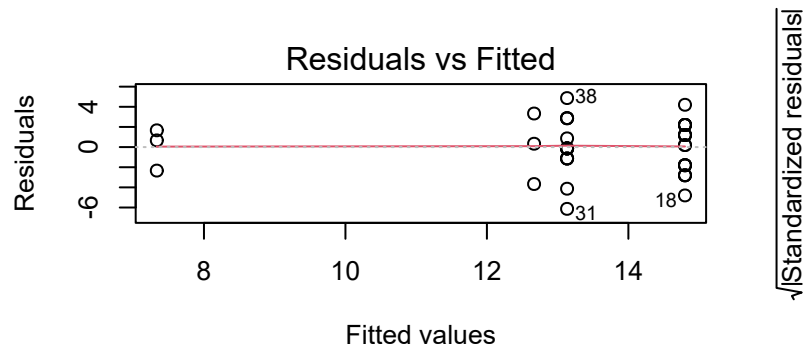
# Anova Table (Type III tests)

Response: minutes

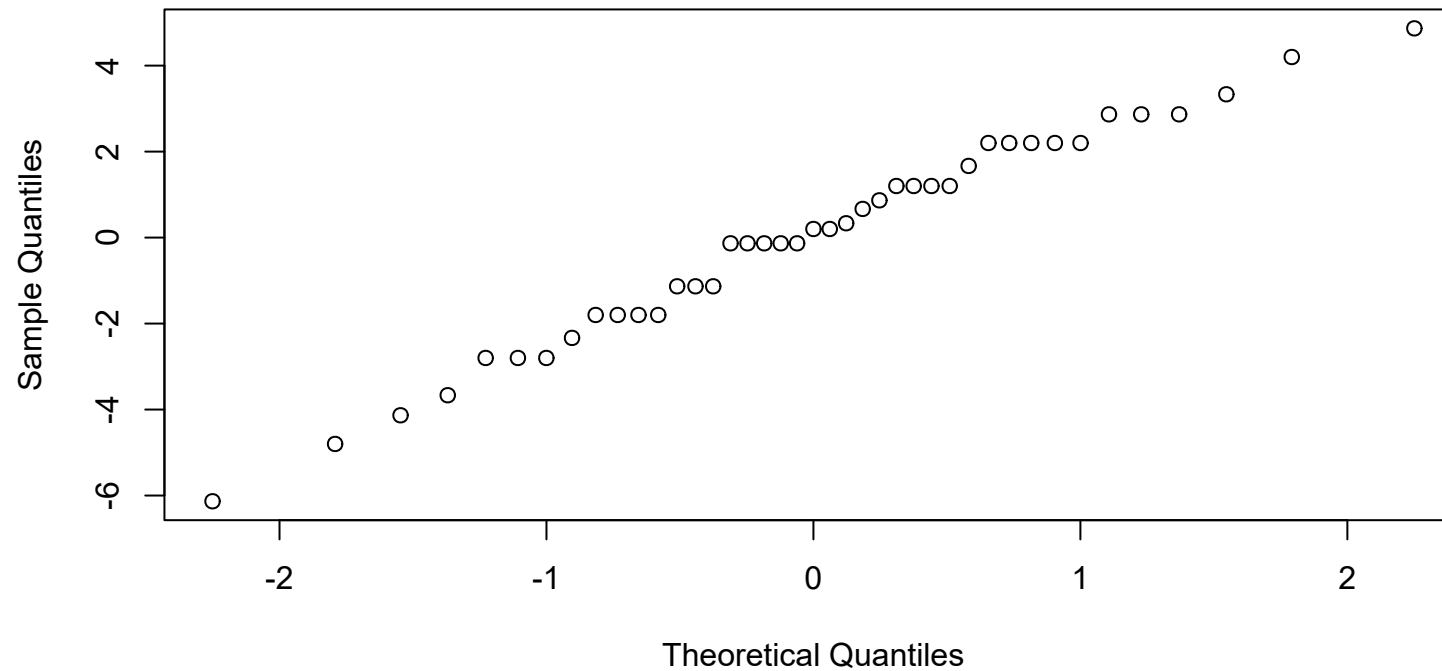
	Sum Sq	Df	F value	Pr(>F)
(Intercept)	4380.8	1	652.8851	< 2.2e-16 ***
blanket	152.0	3	7.5499	0.0004619 ***
Residuals	248.3	37		

---

Signif. codes: 0 '\*\*\*' 0.001 '\*\*' 0.01 '\*' 0.05 '.' 0.1 ' ' 1



## Normal Q-Q Plot



```
[1] TRUE
```

```
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)
b1 - b0 >= 0	-2.1333	1.6038	-1.330	0.2412
b2 - b0 >= 0	-7.4667	1.6038	-4.656	<0.001 ***

```

b3 - b0 >= 0  -1.6667      0.8848  -1.884 0.0926 .
---
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 = 2.1832
95% family-wise confidence level
```

Linear Hypotheses:

	Estimate	lwr	upr
b1 - b0 >= 0	-2.1333	-Inf	1.3680
b2 - b0 >= 0	-7.4667	-Inf	-3.9654
b3 - b0 >= 0	-1.6667	-Inf	0.2649

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)
b1 - b0 >= 0	-2.1333	1.6038	-1.330	0.0958 .
b2 - b0 >= 0	-7.4667	1.6038	-4.656	6.78e-05 ***
b3 - b0 >= 0	-1.6667	0.8848	-1.884	0.0640 .

```

---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
(Adjusted p values reported -- free method)

```

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)
b1 - b0 >= 0  -2.1333      1.7346  -1.230 0.2793
b2 - b0 >= 0  -7.4667      1.1095  -6.730 <1e-04 ***
b3 - b0 >= 0  -1.6667      0.8642  -1.929 0.0847 .
---
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 = 2.1828
95% family-wise confidence level
```

```

Linear Hypotheses:
      Estimate lwr      upr
b1 - b0 >= 0 -2.1333    -Inf  1.6529
b2 - b0 >= 0 -7.4667    -Inf -5.0448
b3 - b0 >= 0 -1.6667    -Inf  0.2197

```

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)
b1 - b0 >= 0  -2.1333      1.7346  -1.230  0.113
b2 - b0 >= 0  -7.4667      1.1095  -6.730 5.3e-08 ***
b3 - b0 >= 0  -1.6667      0.8642  -1.929  0.059 .
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
(Adjusted p values reported -- free method)

```

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