

4. 09. NOV. - ONEDIM DIAGNOSTICS (CONT.)

Note: the orientation of the QQ-plots is a mere convention. Always make sure to look at the axis label to check the orientation used.

Exercise 9. Compare the QQ-plots in figure 7 with the histograms in figure 8.

- Which histogram corresponds to which QQ-plot?
- Can you identify the distributions? Which is which?

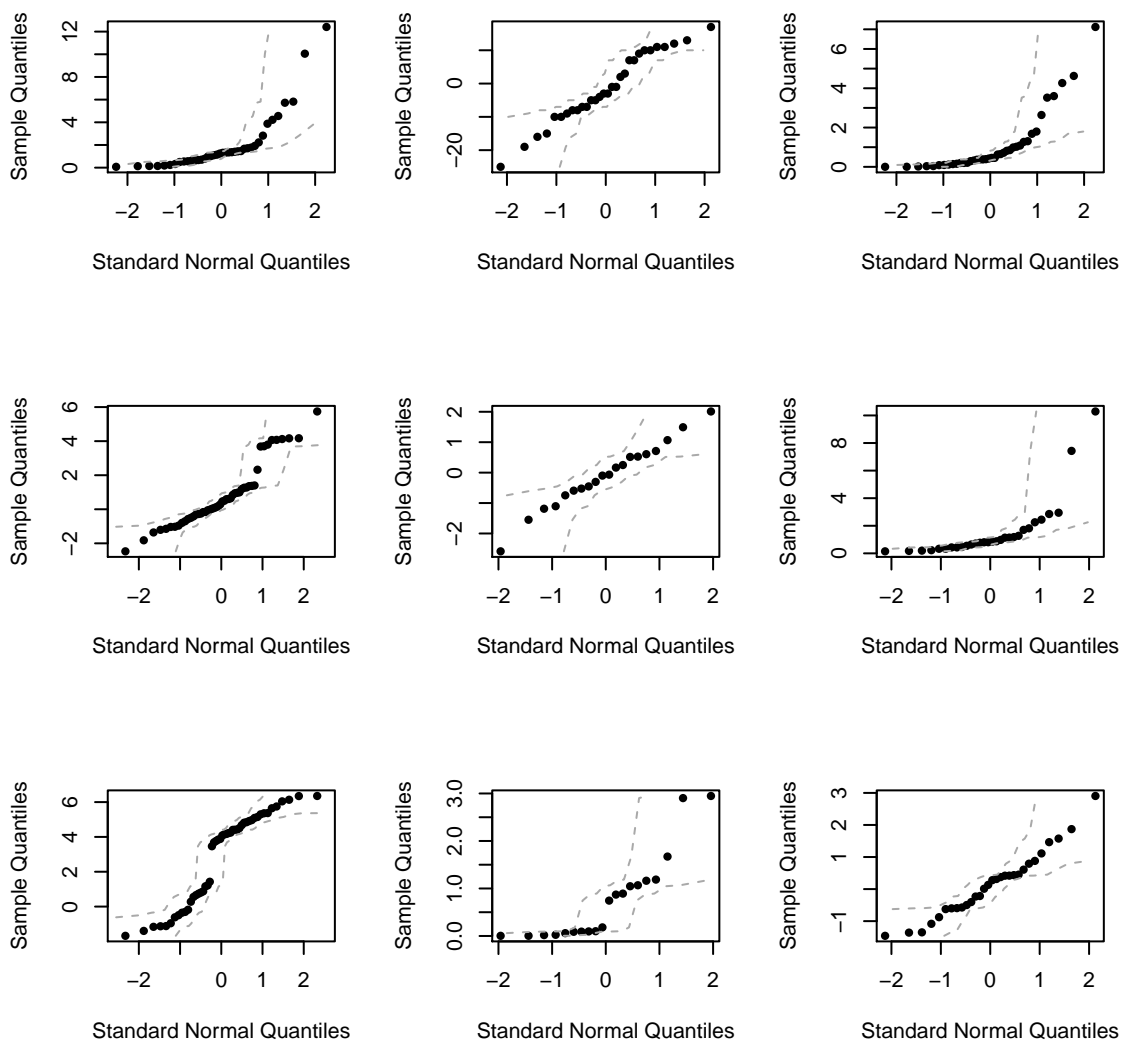


FIGURE 7. QQ-Plot as Diagnostics

Exercise 10. Compare the box&whisker plots in figure 9 with the histograms in figure 8.

- Which box&whisker plot corresponds to which histogram?

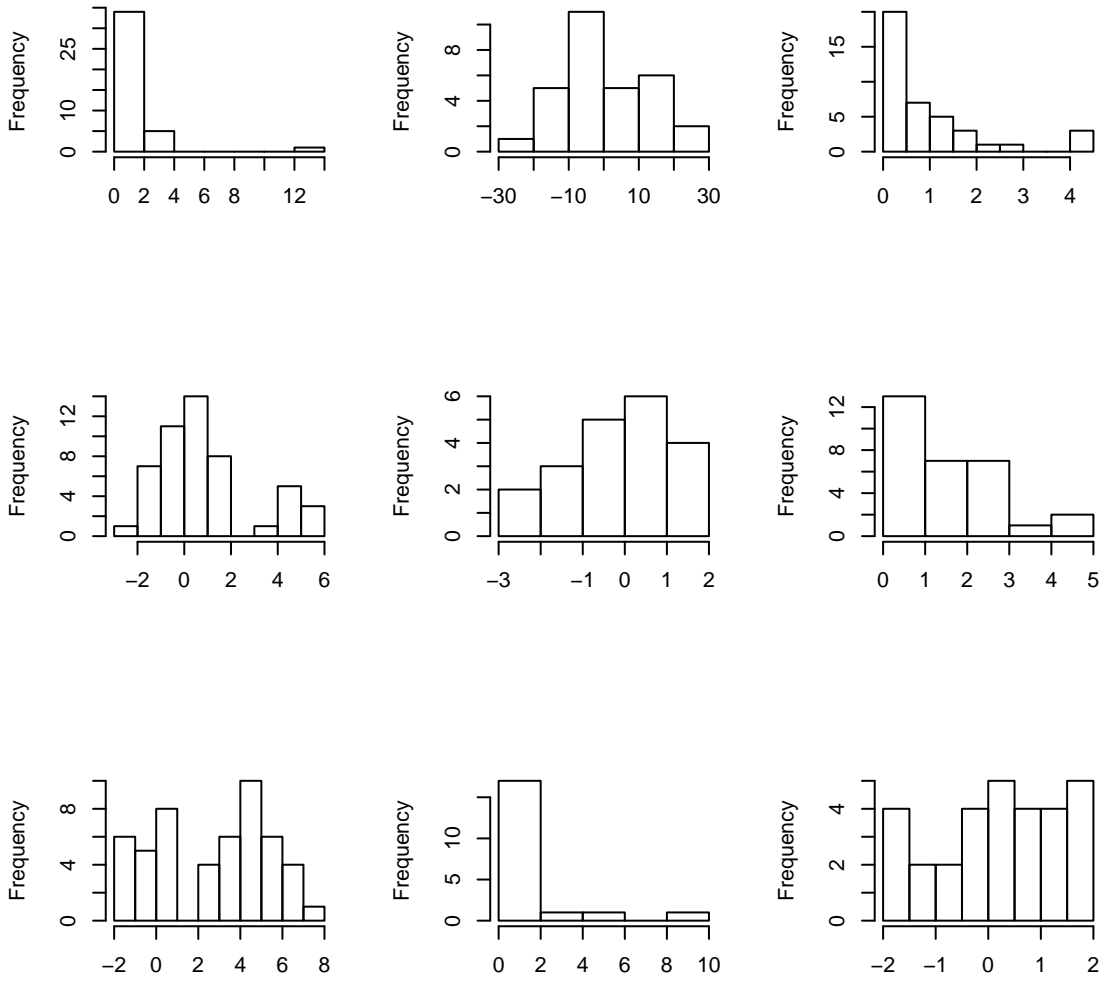


FIGURE 8. Histograms as Diagnostics

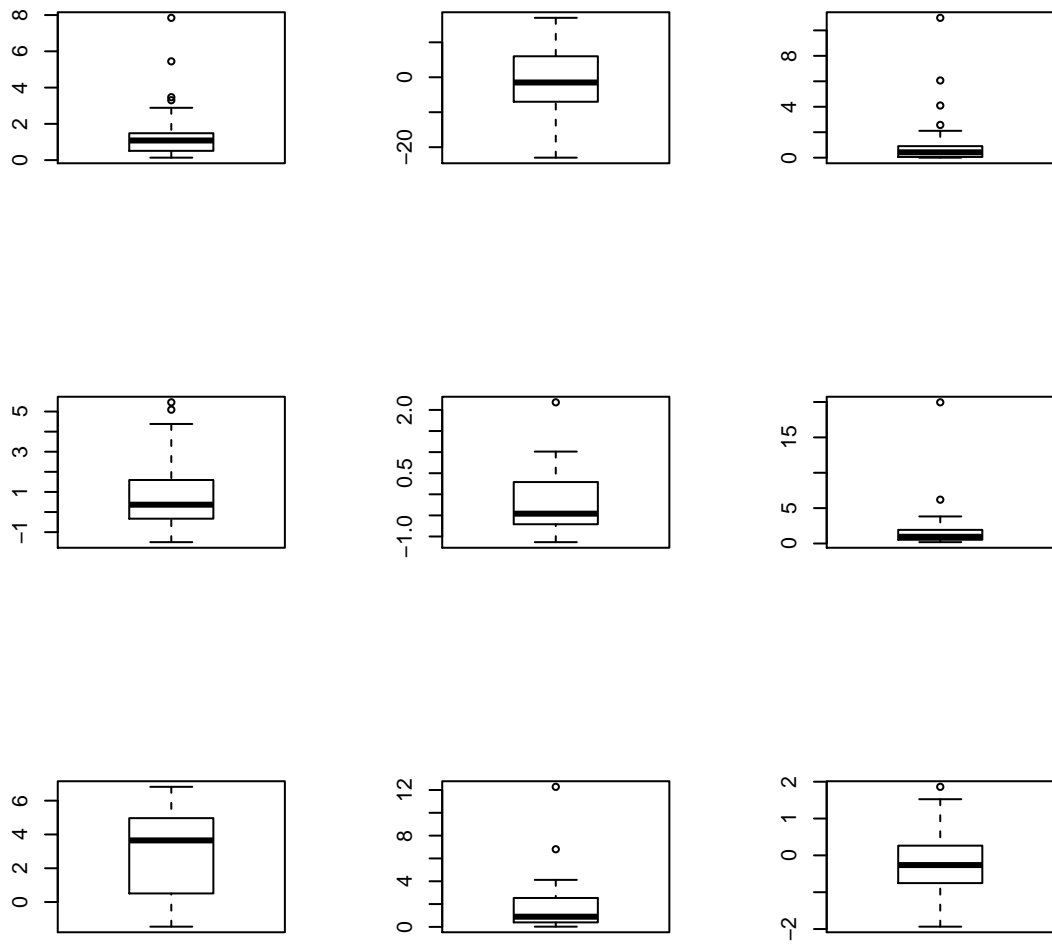


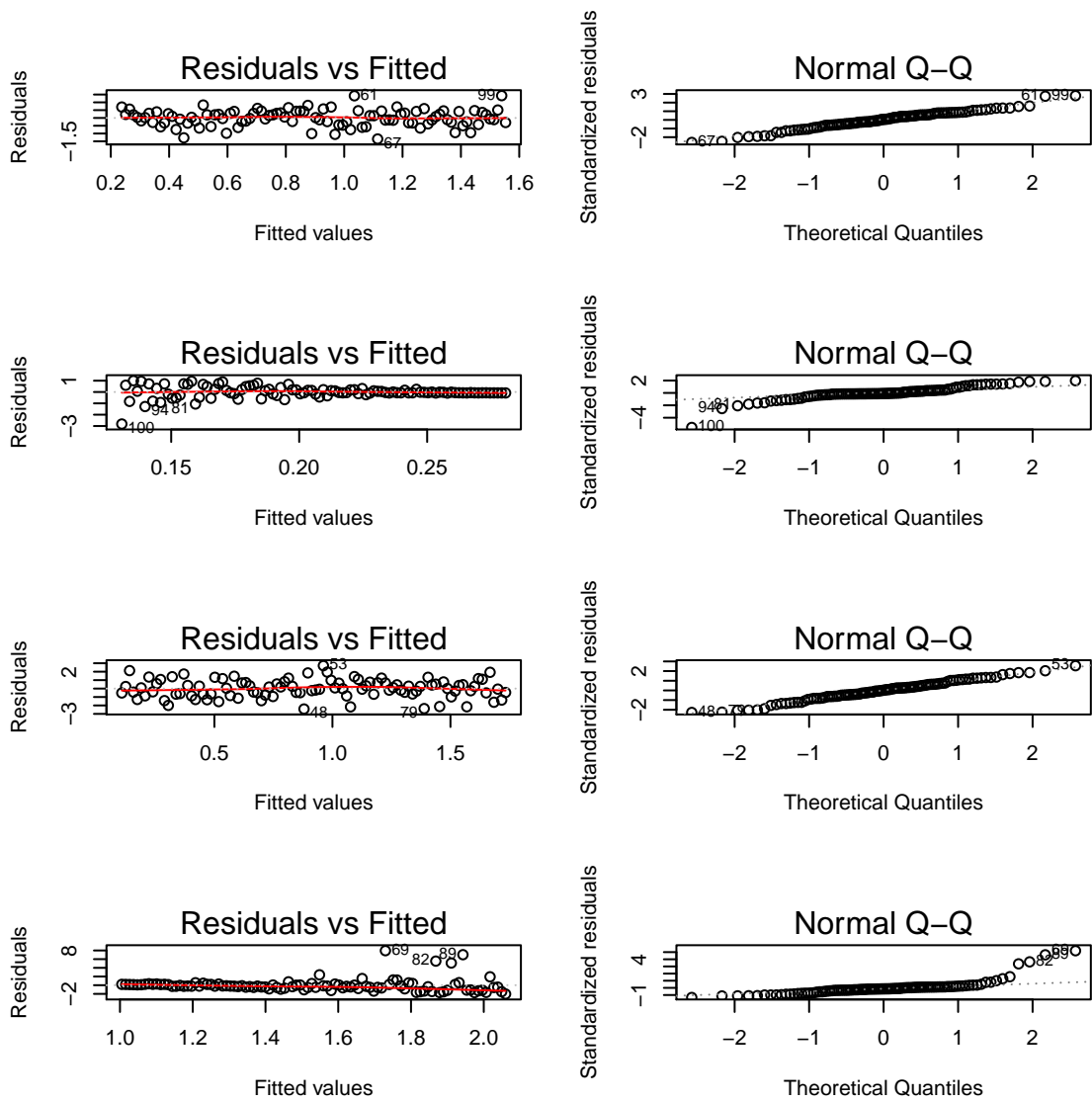
FIGURE 9. Box&whisker plots as Diagnostics

Exercise 11. *figure 10 shows residuals from estimates for linear models for the model and under mis-specification.*

Input

```
n <- 100
x <- (1:n)/n
a <- 0.2
b <- 1.4
y1 <- a+ b*x + rnorm(n);          lmres1 <- lm(y1 ~ x) # a linear model
y2 <- a+ b*x + rnorm(n, sd=0.5); lmres2 <- lm(y2 ~ x) # a linear model, variance=0.25
y3 <- a+ b*x*x + rnorm(n);        lmres3 <- lm(y3 ~ x) # not a linear model: quadratic error
y4 <- a+ b*x*x * rnorm(n);        lmres4 <- lm(y4 ~ x) # linear model, but multiplicative error
y5 <- exp(a+ b*x* rnorm(n));      lmres5 <- lm(y5 ~ x) # exponential linear model
y6 <- a+ b*x + rnorm(n);          lmres6 <- lm(y6 ~ x) # a linear model, again
```

Which plot comes from which equation?

FIGURE 10. Diagnostics from `lm()`

4.1. **Project task: Scottish hill runner's data.** *This is a first draft. Please contact me for extensions and corrections.*

Exercise 12. * Project Task *

Directory <<http://statlab.uni-heidelberg.de/data/scottish/>> contains a waste book with collected statistics and displays on the Scottish hill runner's data.

Use this as a starting point to analyse the data. Prepare a short report of your analysis, and a collection of the relevant analysis material.

You are free to make use of the material in the wastebook as long as you give proper citation.

4.2. **Project task: Faithful Geysers.**

Exercise 13. Sorry. This task is too complicated now. Ignore it now, and come back to it later.

*** Project Task ***

Directory <<http://statlab.uni-heidelberg.de/data/geyser/>> contains a waste book with collected statistics and displays on the old faithful geysers data.

Use this as a starting point to analyse the data. Prepare a short report of your analysis, and a collection of the relevant analysis material.

You are free to make use of the material in the wastebook as long as you give proper citation.
