2.2.1: R - Residual Diagnostics
## Stat 5100: Dr. Bean

Example: (The Toluca Company data from Handout #2)

```r
# Input same toluca data from Ch. 1
library(stat5100)
data(toluca)

# Fit a simple linear model with Y=workhours and X=lotsize
toluca_lm <- lm(workhours ~ lotsize, data = toluca)
toluca_lm

##
## Call:
## lm(formula = workhours ~ lotsize, data = toluca)
##
## Coefficients:
## (Intercept)       lotsize
##       62.37          3.57

# Look at a sequence plot to evaluate independence
seq_plot(toluca_lm)
```
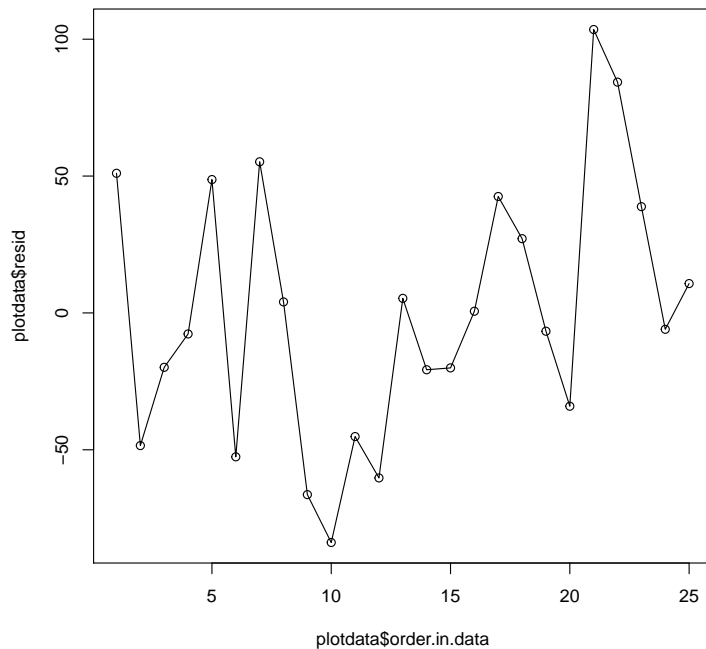
```
# Numerical Diagnostics

# Perform F-test for lack of fit.
ftest_lackfit_lm(toluca_lm)

## Analysis of Variance Table
##
## Model 1: workhours ~ lotsize
## Model 2: workhours ~ lotsize
##   Res.Df   RSS Df Sum of Sq      F Pr(>F)
## 1     23 54825
## 2     14 37581  9     17245 0.7138 0.6893

# Brown-Forsythe test for constant variance
brown_forsythe_lm(toluca_lm)

## [1] "Brown-forsythe test for constant variance in the residuals:"
## [1] "T-statistic: 1.3165, p-value: 0.201"

# Correlation test of normality
cor_normality_lm(toluca_lm)

## Correlation test of normality:
##                    resid expected_norm
## resid         1.0000000     0.9915055
## expected_norm 0.9915055     1.0000000
##
## Total observations: 25
## Make sure to consult with table B.6 for your final result.
```