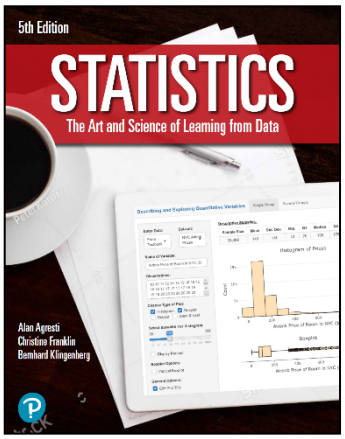


R Code for Examples in the book
"Statistics: The Art and Science of Learning from Data"
by Agresti, Franklin and Klingenberg, 5th edition

Chapter 12

Example 13: College GPA – Using Residuals to Check Model Assumptions

Reading in data:

```
students <-
read.csv(file='https://raw.githubusercontent.com/artofstat/data/master/Chapter12/ga_student_survey.csv')
colnames(students) # check column names
```

```
##  [1] "Height"          "Gender"          "Haircut"         "Job"
##  [5] "Studytime"       "Smokecig"        "Dated"           "HSGPA"
##  [9] "CGPA"            "HomeDist"        "BrowseInternet"  "WatchTV"
## [13] "Exercise"        "ReadNewsP"       "Vegan"
"PoliticalDegree"
## [17] "PoliticalAff"
```

Fitting regression model

```
linReg <- lm(CGPA ~ HSGPA, data = students)
linReg
```

```
##
## Call:
## lm(formula = CGPA ~ HSGPA, data = students)
##
## Coefficients:
## (Intercept)        HSGPA
##      1.1898       0.6369
```

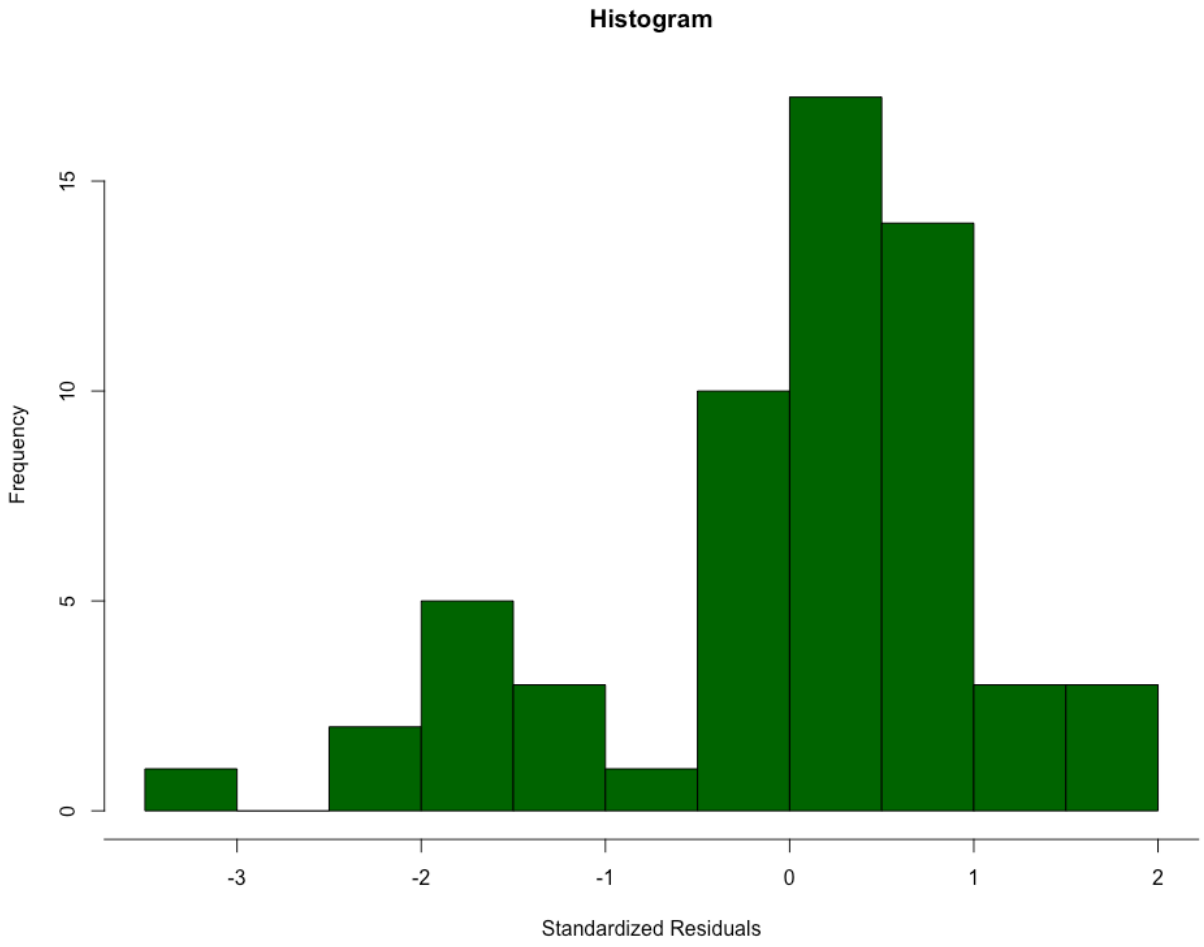
To obtain standardized residuals

```
mystdres <- rstandard(linReg)
head(mystdres)
```

```
##          1          2          3          4          5          6
## -1.1921565 -1.5092691  1.7105551 -0.5545109  0.0548887  1.7297650
```

To create a histogram of the standardized residuals

```
hist(mystdres, col = 'darkgreen', main = 'Histogram', xaxt = 'n',
     xlab = 'Standardized Residuals', ylab = 'Frequency')
axis(1, at = seq(-4, 4, 1))
```



To create a histogram of the boxplot

```
boxplot(mystdres, horizontal = TRUE, col = 'darkgreen',
        main = 'Boxplot', xlab = 'Standardized Residuals')
```