



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:

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

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

Fitting regression model

```
lin.reg <- lm(CGPA ~ HSGPA, data = data)
lin.reg

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

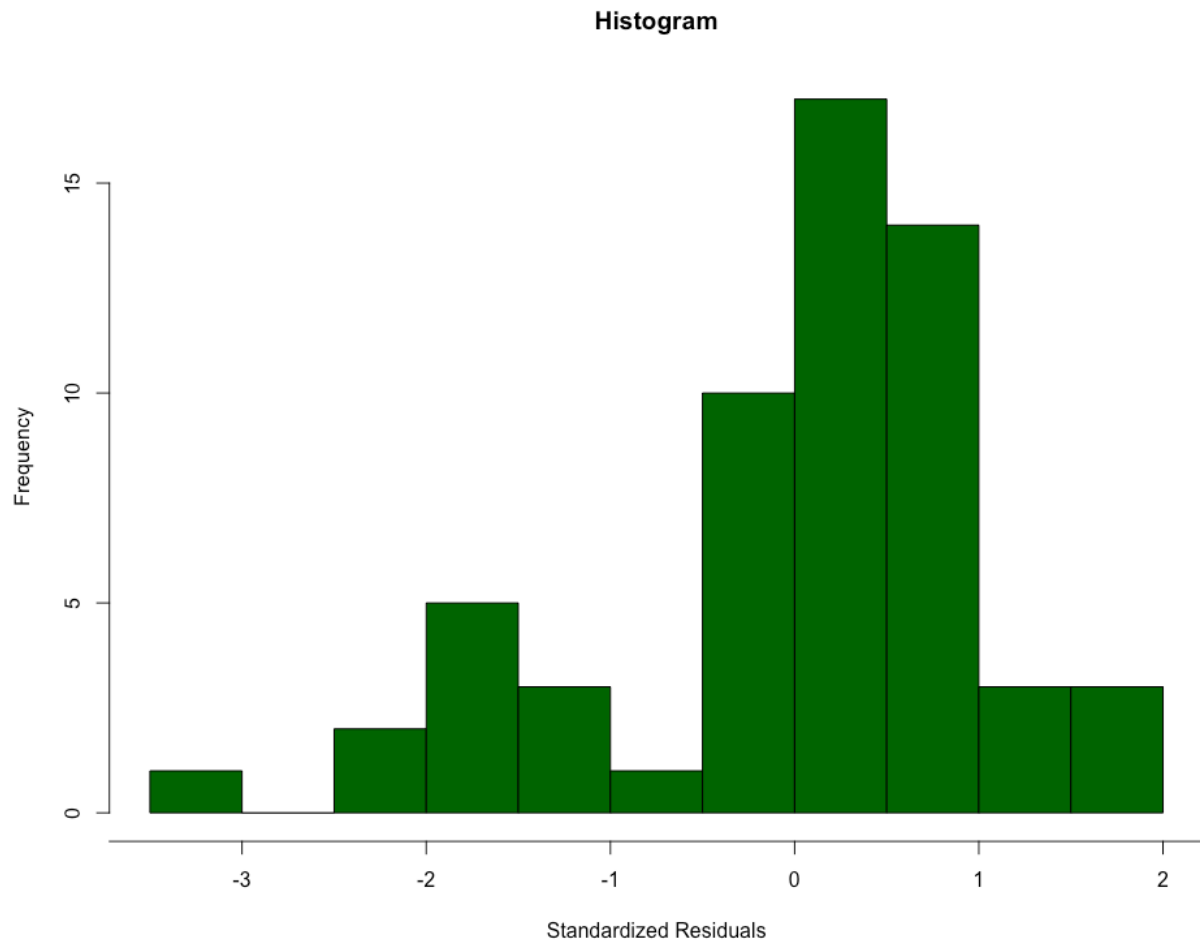
To obtain standardized residuals

```
mystdres <- rstandard(lin.reg)
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')
```

