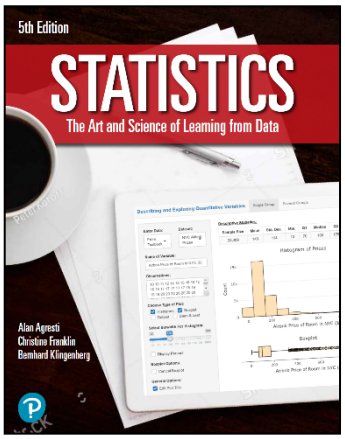

R Code for Examples in the book
"Statistics: The Art and Science of Learning from Data"
by Agresti, Franklin and Klingenberg, 5th edition

Chapter 12

Example 4: Variability of Athletes' Strengths – Residual Standard Deviation

Reading in data

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

```
##  [1] "Athlete"             "BP60"                "maxBP..lbs."
##  [4] "LP200"               "maxLP..lbs."         "Situps..per.minute."
##  [7] "X40YD..sec."         "VerticalJump..in."   "SitReach..in."
## [10] "MB..in."             "SR..sec."            "Age"
## [13] "Height..in."         "Weight..lbs."        "Bodyfat...."
## [16] "BMI"                 "Sport"
```

Fitting regression model

```
lin.reg <- lm(maxBP..lbs. ~ BP60, data = data)
lin.reg
```

```
##
## Call:
## lm(formula = maxBP..lbs. ~ BP60, data = data)
##
## Coefficients:
## (Intercept)         BP60
##      63.537        1.491
```

To obtain residual sum of squares

```
rss <- sum(lin.reg$residuals ** 2)
rss
```

```
## [1] 3522.806
```

To find total number of observations in the dataset

```
n <- length(lin.reg$residuals)
n
```

```
## [1] 57
```

To compute residual standard deviation

```
sqrt(rss / (n - 2))
```

```
## [1] 8.003188
```