



R Code for Examples in the book

*"Statistics: The Art and Science of Learning from Data"*

by Agresti, Franklin and Klingenberg, 5<sup>th</sup> edition

## Chapter 12

### Example 14: Variability of Athletes' Strengths – Residual Standard Deviation

#### Reading in data

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

```
linReg <- lm(maxBP..lbs. ~ BP60, data = athletes)
linReg

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

#### To obtain residual sum of squares

```
rss <- sum(linReg$residuals ** 2)
rss

## [1] 3522.806
```

#### To find total number of observations in the dataset

```
n <- length(linReg$residuals)
n

## [1] 57
```

To compute residual standard deviation

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

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