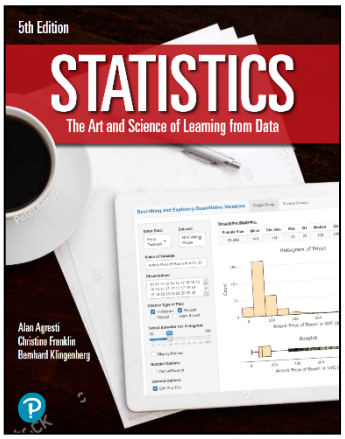

R Code for Examples in the book
"Statistics: The Art and Science of Learning from Data"
by Agresti, Franklin and Klingenberg, 5th edition

Chapter 13

Example 6: Hypothesis Test for Multiple Regression Parameter β

Reading in data

```
data <-
read.csv(file='https://raw.githubusercontent.com/artofstat/data/master/Chapter13/college_female_athletes.csv')
```

To obtain the summaries for the variables

```
summary(data$TBW)

##    Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
##    96.0   119.8   131.5   133.0   143.2   185.0

summary(data$HGT)

##    Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
##   56.00   63.00   65.00   65.55   68.06   75.00

summary(data$BF)

##    Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
##  0.1120  0.1520  0.1850  0.1844  0.2150  0.2760

summary(data$AGE)

##    Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
##   17.00   18.00   20.00   20.02   22.00   23.00
```

Fitting in multiple regression model

```
lin.reg <- lm(TBW ~ HGT + BF + AGE, data = data)
```

To obtain a summary of the regression model which includes the test statistic and corresponding p-value for a hypothesis test

```
summary(lin.reg)

##
## Call:
## lm(formula = TBW ~ HGT + BF + AGE, data = data)
##
## Residuals:
##     Min      1Q  Median      3Q     Max
## -20.724  -5.439   1.096   5.660  32.865
##
## Coefficients:
##             Estimate Std. Error t value Pr(>|t|)
## (Intercept) -97.6938    28.7852  -3.394  0.00123 **
## HGT           3.4285     0.3679   9.319 2.88e-13 ***
## BF          136.4265    31.2553   4.365 5.10e-05 ***
## AGE          -0.9601     0.6483  -1.481  0.14384
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 10.11 on 60 degrees of freedom
## Multiple R-squared:  0.6693, Adjusted R-squared:  0.6528
## F-statistic: 40.48 on 3 and 60 DF,  p-value: 1.977e-14
```