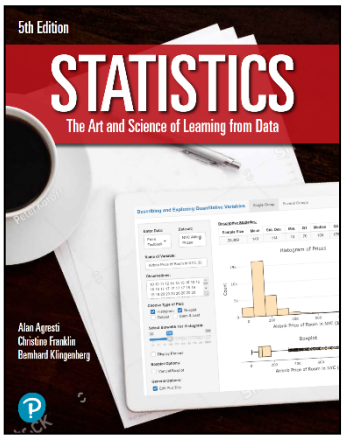

R Code for Examples in the book
"Statistics: The Art and Science of Learning from Data"
by Agresti, Franklin and Klingenberg, 5th edition

Chapter 14

Example 6: Friends and Happiness – Tukey Test

Reading in data

```
data <-
read.csv(file='https://raw.githubusercontent.com/artofstat/data/master/Chapter14/gss_1998_happy_numfriends.csv')
head(data)
```

```
##   NumFriends X1.VERY.HAPPY X2.PRETTY.HAPPY X3.NOT.TOO.HAPPY
## 1          1             8              33               10
## 2          2            35              82               17
## 3          3            38              79               15
## 4          4            36              75                7
## 5          5            28              57               10
## 6          6            30              35                5
```

To convert the data into long format, you can use the `pivot_longer()` function from the tidyverse library

```
library(tidyverse)
data <-
  data %>%
  rename_at(2:4, ~ c('very_happy', 'pretty_happy', 'not_too_happy')) %>%
  pivot_longer(2:4, names_to = 'Happiness', values_to = 'Count') %>%
  uncount(Count) %>%
  relocate(Happiness)
attach(data)
tapply(NumFriends, Happiness, summary)
```

```
## $not_too_happy
##    Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
##   1.000   2.000   4.000   6.271   6.000  50.000
##
## $pretty_happy
##    Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
##   1.000   2.500   4.000   5.667   6.000  60.000
##
## $very_happy
```

```
##    Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
##   1.000   3.000   5.000   7.577  10.000  75.000
```

To perform a Tukey test

```
myAnova <- aov(NumFriends ~ Happiness)
tukey.test <- TukeyHSD(myAnova)
tukey.test
```

```
##   Tukey multiple comparisons of means
##     95% family-wise confidence level
##
## Fit: aov(formula = NumFriends ~ Happiness)
##
## $Happiness
##                                   diff        lwr      upr     p adj
## pretty_happy-not_too_happy -0.6039216 -2.5876540 1.379811 0.7547887
## very_happy-not_too_happy    1.3061908 -0.7860212 3.398403 0.3079598
## very_happy-pretty_happy     1.9101124  0.6170907 3.203134 0.0015952
```