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

Chapter 9

Example 8: Weight Change – One-Sided Significance Test about the Mean

Reading in the data

```
data =
read.csv(file='https://raw.githubusercontent.com/artofstat/data/master/Chapter9/anorexia.csv')
attach(data) # so we can refer to variable names
```

To perform a one-sided significance test about the mean

```
t.test(x = cogchange, mu = 0, alternative = 'greater')

##
##   One Sample t-test
##
## data:  cogchange
## t = 2.2156, df = 28, p-value = 0.01751
## alternative hypothesis: true mean is greater than 0
## 95 percent confidence interval:
##  0.6981979        Inf
## sample estimates:
## mean of x
##  3.006897
```

Alternatively, you can also do the manual computation

```
x <- cogchange
n <- length(cogchange)
xbar <- mean(x)
se <- sd(x) / sqrt(n)
mu_0 <- 0 # the value that mu takes in the null hypothesis
t_statistic <- (xbar - mu_0) / se
```

To compute the p value for a one-sided significance test

```
pt(t_statistic, df= n - 1, lower.tail = FALSE)

## [1] 0.0175113
```