Statistical Inference: Week 4 Project: Part II

Author: Alexander Johannes

Date: 10 August 2021

Link to my Statistical Inference repository: [My Repo]

Overview

This report details the process of performing some basic statistical analysis on the `ToothGrowth` data set.

Part II: Basic Inferential Data Analysis

Step 1: Loading the data and performing some basic analysis:

```
data(ToothGrowth)
head(ToothGrowth)
```

```
##    len supp dose
## 1  4.2   VC  0.5
## 2 11.5   VC  0.5
## 3  7.3   VC  0.5
## 4  5.8   VC  0.5
## 5  6.4   VC  0.5
## 6 10.0   VC  0.5
```

```
names(ToothGrowth)
```
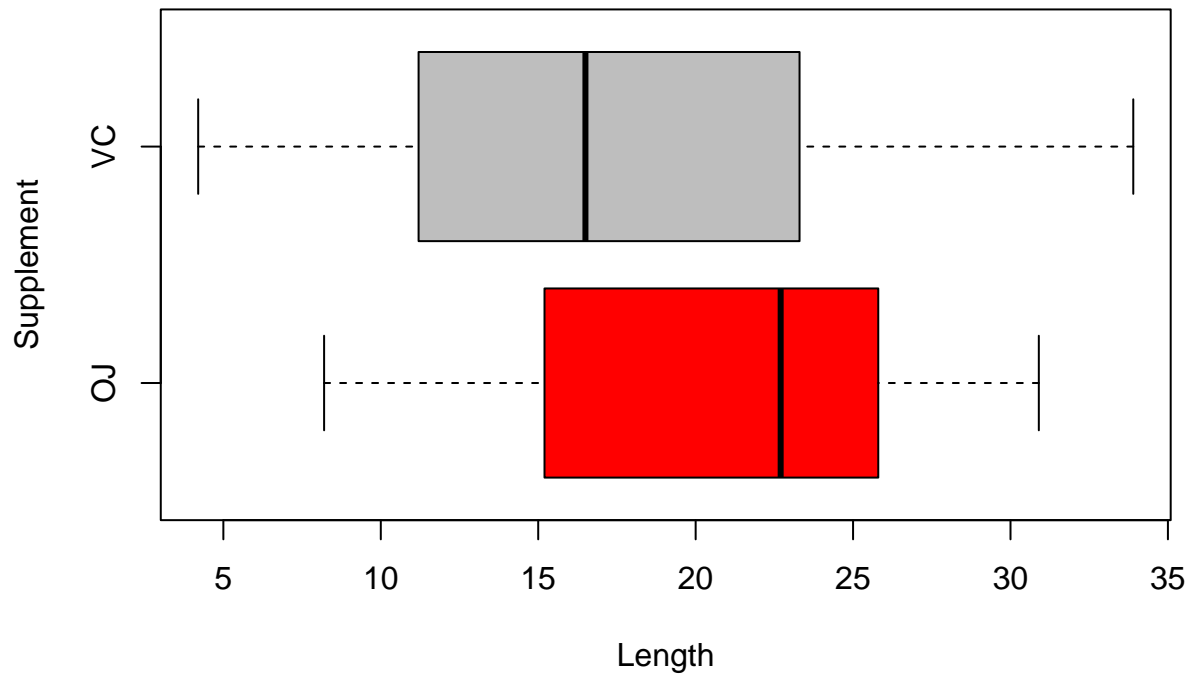
```
## [1] "len"  "supp" "dose"
```

```
tapply(ToothGrowth$len, ToothGrowth$supp, mean)
```

```
##        OJ       VC
## 20.66333 16.96333
```

Step 2: A basic summary of the data, with a visualization:

```
##       len          supp         dose
##  Min.   : 4.20   OJ:30   Min.   :0.500
##  1st Qu.:13.07   VC:30   1st Qu.:0.500
##  Median :19.25           Median :1.000
##  Mean   :18.81           Mean   :1.167
##  3rd Qu.:25.27           3rd Qu.:2.000
##  Max.   :33.90           Max.   :2.000
```

Summary Statistics

Step 3: Hypothesis tests (t-test) to compare tooth growth by supp and dose

```
##                p.value  Conf.Low Conf.High
## Dosage 0.5 0.006358607  1.719057  8.780943
## Dosage 1   0.001038376  2.802148  9.057852
## Dosage 2   0.963851589 -3.798070  3.638070
```

Step 4: Conclusions and Assumptions

We reject the null hypothesis for a dosage of .5 and 1, meaning there is a difference in tooth growth by delivery method (at the .05 significance level).

We have performed our t-test under the assumption of unequal variances.