

Statistical Inference course project - Part 2

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Overview

In this part of the project we're going to analyze the ToothGrowth data in the R datasets package.

1. Load the ToothGrowth data and perform some basic exploratory data analyses
2. Provide a basic summary of the data.
3. Use confidence intervals and/or hypothesis tests to compare tooth growth by supp and dose. (Only use the techniques from class, even if there's other approaches worth considering)
4. State your conclusions and the assumptions needed for your conclusions.

Loading the ToothGrowth dataset and preparing it for analysis.

```
#Loading the ToothGrowth dataset
```

```
library(datasets)
data(ToothGrowth)
```

```
# Fetching the structure of the dataset
```

```
str(ToothGrowth)
```

```
## 'data.frame': 60 obs. of 3 variables:
## $ len : num 4.2 11.5 7.3 5.8 6.4 10 11.2 11.2 5.2 7 ...
## $ supp: Factor w/ 2 levels "OJ","VC": 2 2 2 2 2 2 2 2 2 2 ...
## $ dose: num 0.5 0.5 0.5 0.5 0.5 0.5 0.5 0.5 0.5 0.5 ...
```

```
# Fetching the first few rows
```

```
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
```

```
# Summarizing the dataset
```

```
summary(ToothGrowth)
```

```
## 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
```

Further breaking down the dataset for analysis

```
unique(ToothGrowth$supp)
```

```
## [1] VC OJ  
## Levels: OJ VC
```

```
unique(ToothGrowth$dose)
```

```
## [1] 0.5 1.0 2.0
```

So from the above we get 2 levels of supplements and 3 levels of dose.

- supp = 'OJ', 'VC'
- dose = 0.5, 1, 2

Graphically, we can also use boxplot to provide a quick visual on the impact of dosage and supplement on the tooth growth, see below:

```
library(ggplot2)  
tg_supp_dose <- ggplot(ToothGrowth, aes(x=dose, y=len))  
tg_supp_dose <- tg_supp_dose + geom_boxplot(aes(fill=factor(dose)))  
tg_supp_dose <- tg_supp_dose + geom_point()  
tg_supp_dose <- tg_supp_dose + facet_grid(.~supp)  
tg_supp_dose <- tg_supp_dose + ggtitle("Tooth Growth by Supplement & Dosage")  
tg_supp_dose
```

