Statistical Inference Course Project Part 2

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```
# loading the required libraries
library(ggplot2)
library(dplyr)
```

Basic Inferential Data Analysis

1. Overview

In this analysis, the ToothGrowth data will be analyzed. This shows the effect of vitamin C on teeth-growth in guinea pigs. Two vitamin C supplements are used, with varying dose levels.

2. Loading the Dataset and basic Exploratory Data Analysis

The ToothGrowth data set has to be loaded from the `datasets` package in R.

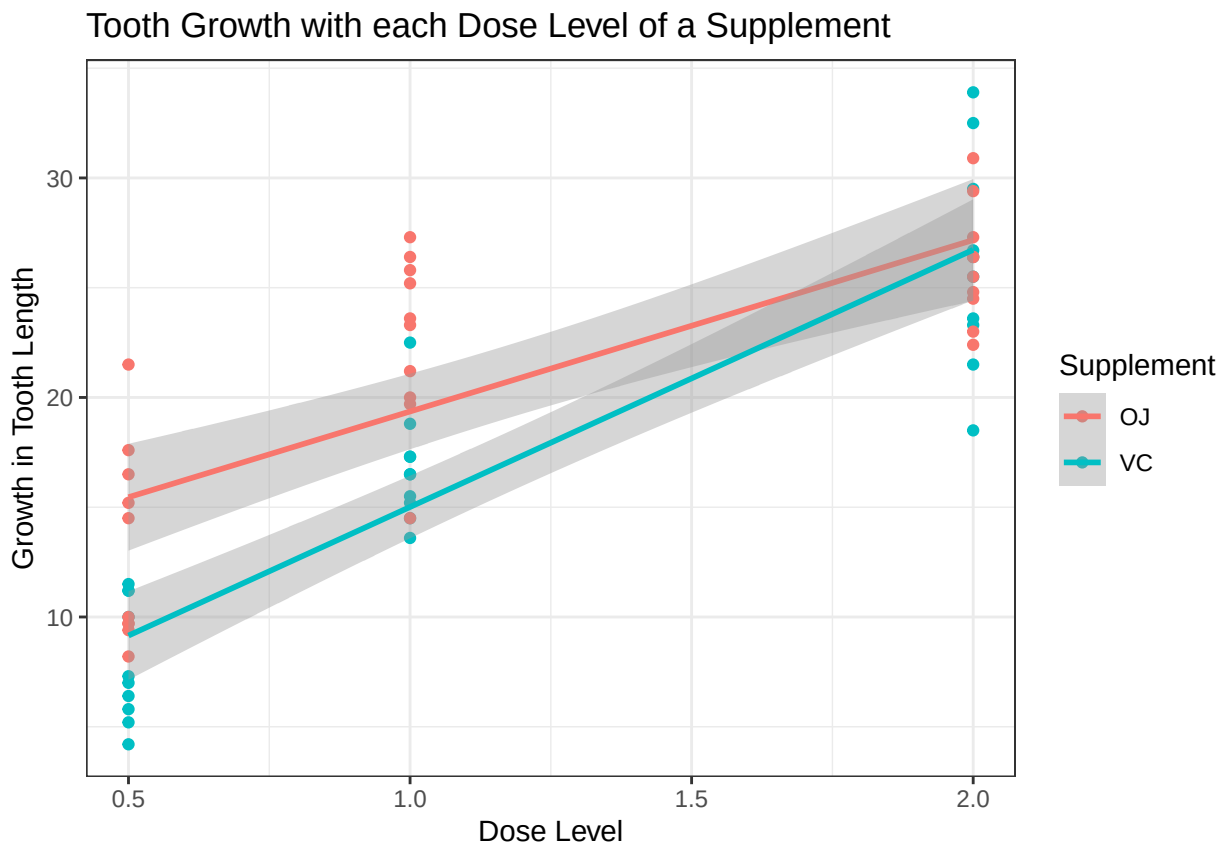
```
# loading the datasets package
library(datasets)

# loading the ToothGrowth data set
data("ToothGrowth")
```

Next, a plot will be created showing the trends in tooth-growth with respect to each supplement

```
# creating a point plot of the variation of teeth growth with respect to each dose level
# of a supplement, and fitting a linear line over those points
qplot(x = dose, y = len, data = ToothGrowth, color = supp, geom = "point",
      main = "Tooth Growth with each Dose Level of a Supplement",
      xlab = "Dose Level", ylab = "Growth in Tooth Length") +
geom_smooth(method = "lm") + theme_bw() + labs(colour = "Supplement")
```

```
## `geom_smooth()` using formula 'y ~ x'
```



From the plot, it is clear that the tooth length increases with increasing levels of dose of both supplements, and the *OJ* supplement has higher tooth length growths than the *VC* supplement. The growth rate for the two supplements merge at dose levels of 2 mg/day, whereas there is some difference in growth levels for the lower dose levels of the two supplements. Also, the growth rate with respect to each dose level of *VC* is higher than that of *OC*.

3. Basic Data Summary

A summary of the whole dataset has been shown below

```
# generating a summary of all variables in 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
```

```
# mean tooth growth length
mean(ToothGrowth$len)
```

```
## [1] 18.81333
```

```
# standard deviation of the length of tooth growth
sd(ToothGrowth$len)
```

```
## [1] 7.649315
```