Statistical Inference Course Project Part 2

RossAW

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In the second portion of the class, we're going to analyze the ToothGrowth data in the R datasets package.

**Loading the Data and Providing a basic summary**

```
library(datasets)
library(dplyr)
```

```
##
## Attaching package: 'dplyr'
##
## The following objects are masked from 'package:stats':
##
##     filter, lag
##
## The following objects are masked from 'package:base':
##
##     intersect, setdiff, setequal, union
```

```
library(ggplot2)

TGData<-ToothGrowth
SummarisedData<-summarise(group_by(TGData,supp,dose),
                    MeanLen = mean(len,na.rm = TRUE))


ggplot(SummarisedData, aes(x=dose, y=MeanLen, group = supp, colour = supp)) +
    geom_line() +
    geom_point( size=4, shape=21, fill="white")+
    ylab("Mean Tooth Length")+
    xlab("Dose (mg/day)")+
    ggtitle("Mean Tooth Length vs Dose")
```

Mean Tooth Length vs Dose
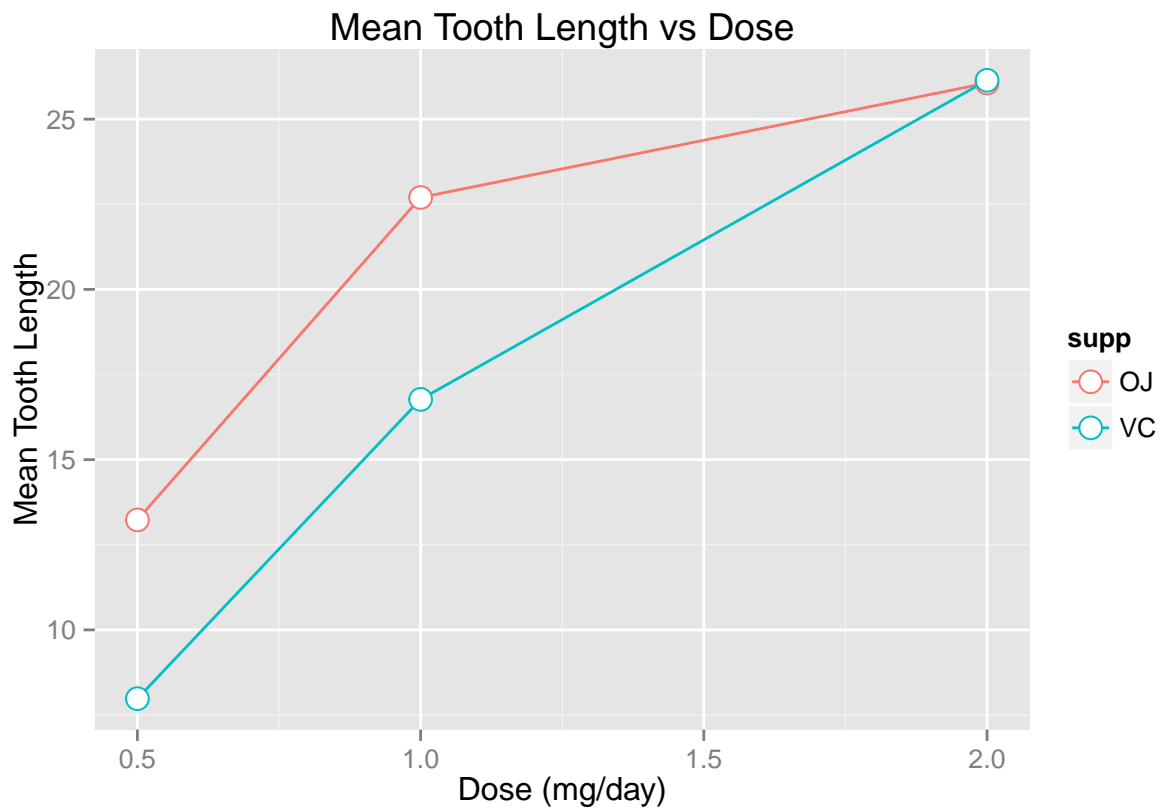

```r
summary(TGData)
```

```
##      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
```

Use confidence intervals and hypothesis tests to compare tooth growth by supp and dose. (Use the techniques from class even if there's other approaches worth considering)

```r
supp.t1 <- t.test(len~supp, paired=F, var.equal=T, data=TGData)
supp.t2 <- t.test(len~supp, paired=F, var.equal=F, data=TGData)
```

```r
supp.result <- data.frame("p-value"=c(supp.t1$p.value, supp.t2$p.value),
                          "Conf-Low"=c(supp.t1$conf[1],supp.t2$conf[1]),
                          "Conf-High"=c(supp.t1$conf[2],supp.t2$conf[2]),
                          row.names=c("Equal Var","Unequal Var"))
supp.result
```

```
##              p.value   Conf.Low Conf.High
## Equal Var   0.06039337 -0.1670064  7.567006
## Unequal Var 0.06063451 -0.1710156  7.571016
```

State your conclusions and the assumptions needed for your conclusions.

We can concluded that both orange juice and vitamin C have an impact on tooth growth. We can also concluded that increasing the dosage will increase the impact on tooth growth ove the 0.5 to 2mg/day range.