

Statistical Inference Course Project Part 2

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Part 2: Basic Inferential Data Analysis on ToothGrowth Dataset

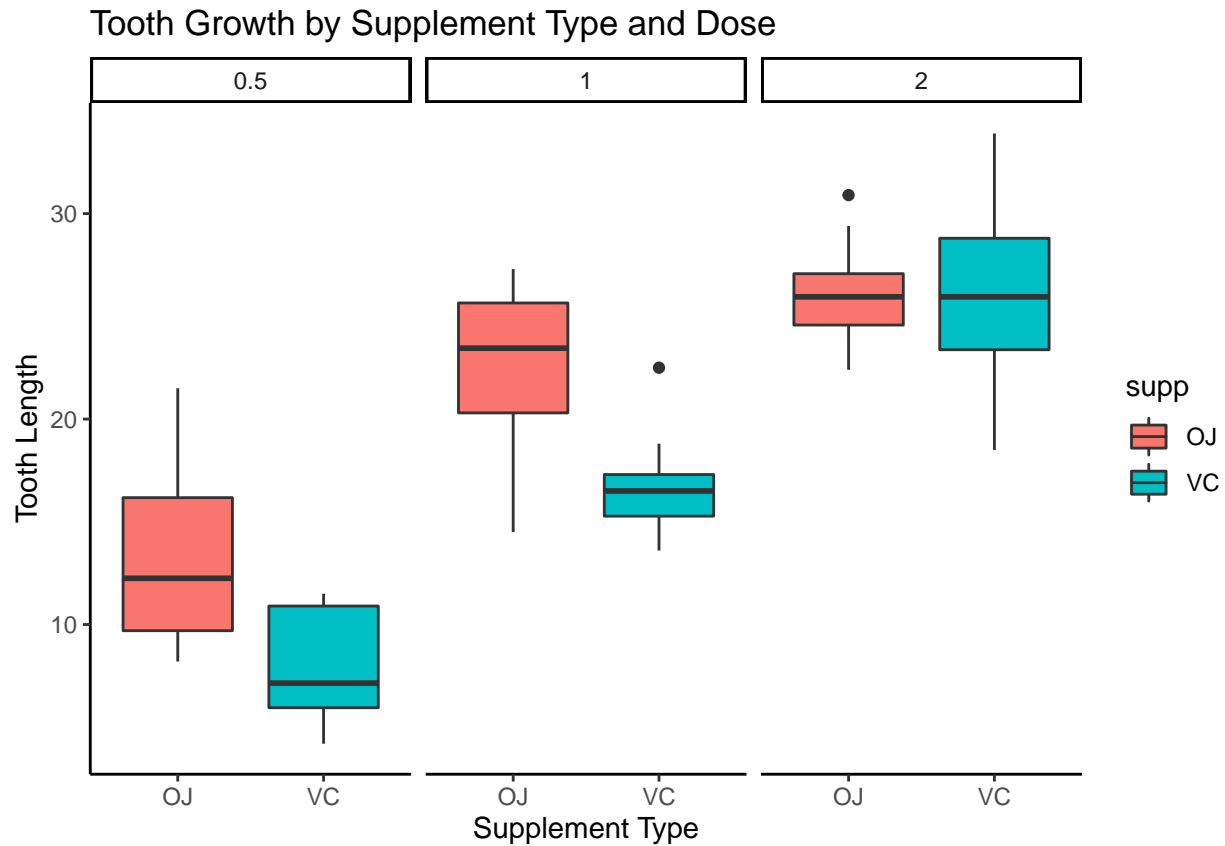
The following was created for part 2 of Courera's Statistical Inference course project [1]. The data from "The Effect of Vitamin C on Tooth Growth in Guinea Pigs" was explored and found to show that increasing dosages of either orange juice or ascorbic acid resulted in longer teeth in the studied guinea pigs. Further, that at all but the highest dosages, orange juice was more effective than ascorbic acid.

Data Summary

```
data("ToothGrowth")
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

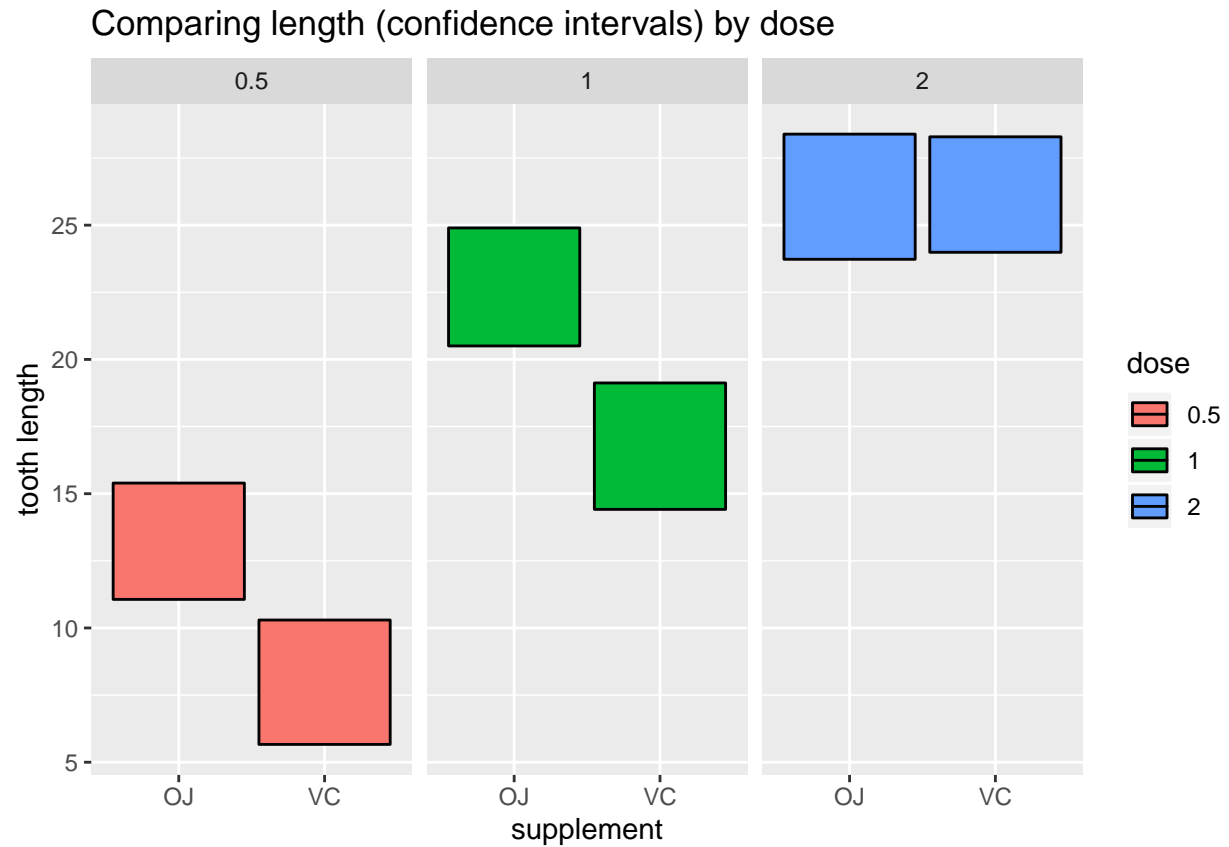
Visualize the dataset



Computing Confidence Intervals

```
##      supp dose  mean      sd    n      min      max
## 1    OJ   0.5  13.23  4.459709  10  11.064300  15.39570
## 2    OJ   1   22.70  3.910953  10  20.502166  24.89783
## 3    OJ   2   26.06  2.655058  10  23.730220  28.38978
## 4    VC   0.5   7.98  2.746634  10   5.664568  10.29543
## 5    VC   1   16.77  2.515309  10  14.415961  19.12404
## 6    VC   2   26.14  4.797731  10  23.990112  28.28989
```

```
g <- ggplot(summaries)
g <- g + labs(title = "Comparing length (confidence intervals) by dose", x = "supplement", y = "tooth length")
g <- g + geom_crossbar(
  aes(ymin = min, ymax = max, x = supp, y = min, fill = dose),
  fatten = 0
)
g <- g + facet_wrap(~dose)
g
```



Results

Based on the summary above we can say (with 95% of sure that):

- lengths when using OJ (.5 dose) bigger than VC (.5 dose)
- lengths when using OJ (1.0 dose) bigger than VC (1.0 dose)
- lengths when using 2.0 of both OJ and VC are similar.