Tooth Growth Analysis

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We will load the Tooth Growth data set and provide a summary and exploration of the data set.

We will then determine if given the size of the groups the differences between the means in each group atre statistically significant.

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

```
summary(ToothGrowth) ##summarise 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
```

The following table lists the mean tooth length for each group

```
ag <- aggregate(len ~ ., data = ToothGrowth, mean)
xtabs(len ~ ., data = ag)
```

```
##     dose
## supp   0.5     1     2
##   OJ 13.23 22.70 26.06
##   VC  7.98 16.77 26.14
```

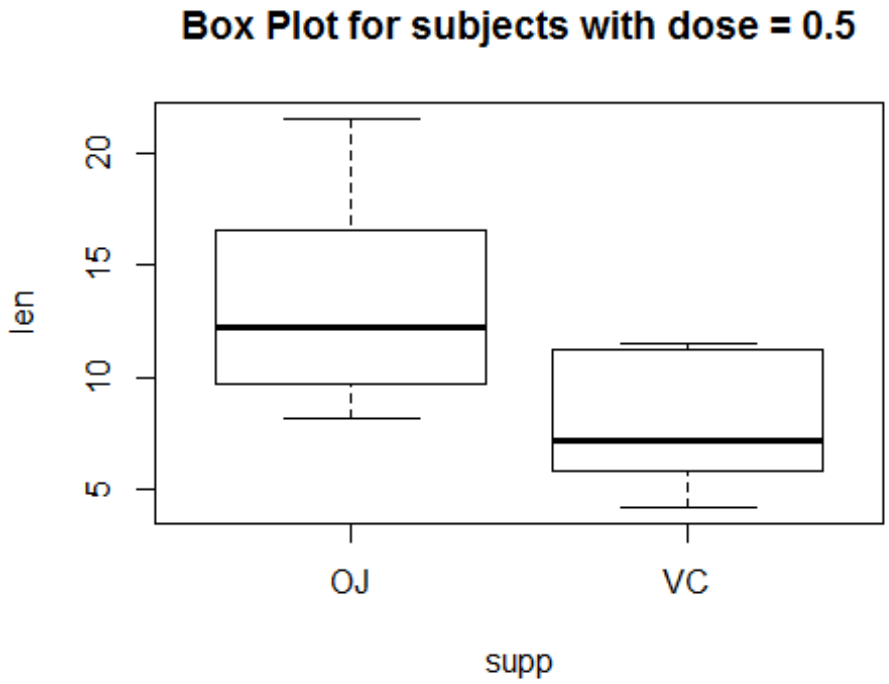
The following table lists the standard deviation of the tooth length for each group

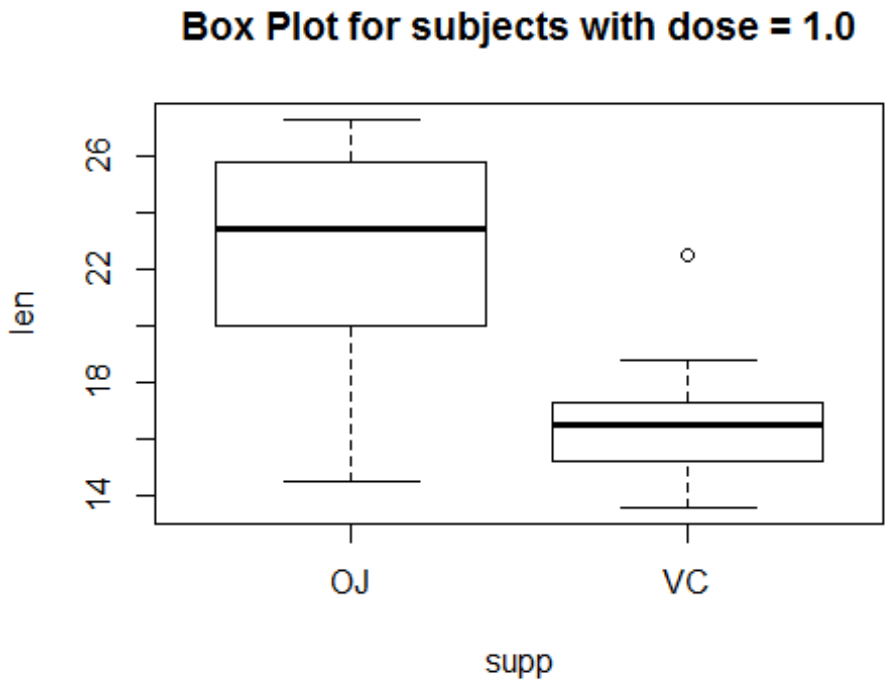
```
ag <- aggregate(len ~ ., data = ToothGrowth, sd)
xtabs(len ~ ., data = ag)
```

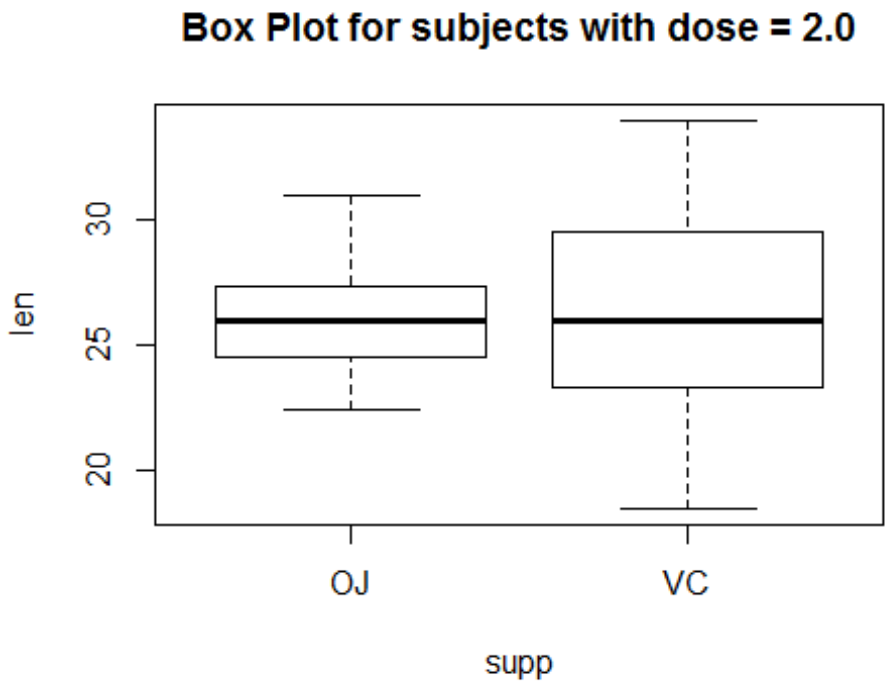
```
##     dose
## supp      0.5        1        2
```

```
##   OJ 4.459709 3.910953 2.655058
##   VC 2.746634 2.515309 4.797731
```

Next we display confidence intervals for our three dosage groups







From this it is apparent thet the differences in mean between the two treatments is significant for dose levels 0.5 and 1.0 but are insignificant for dose rates 2.0.

This is assuming that all variables are distributed according to a normal distribution.