

# Course Project2

```
library(datasets)
data(ToothGrowth)
library(ggplot2)
```

```
## Warning: package 'ggplot2' was built under R version 3.3.3
```

```
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 ...
```

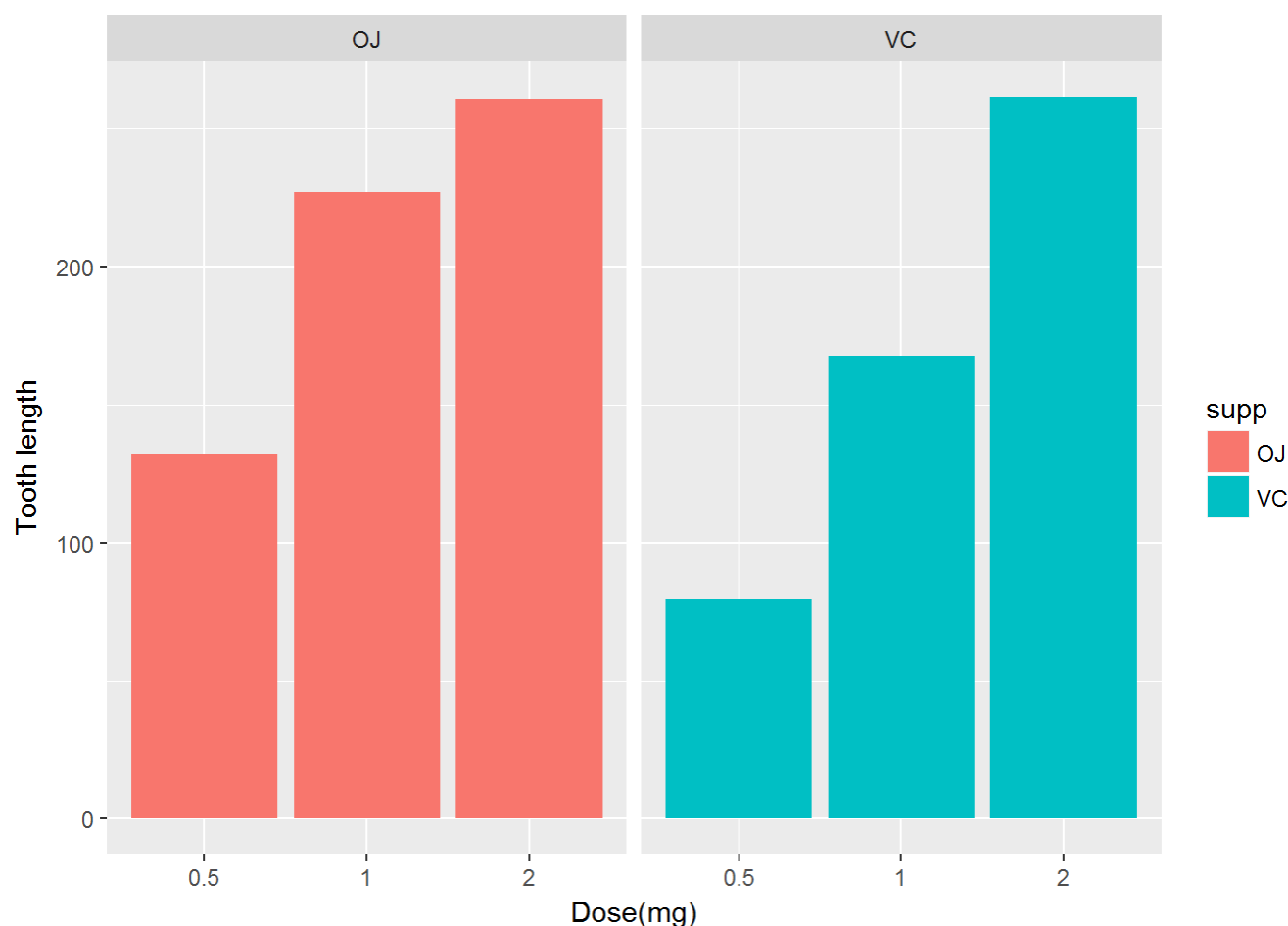
```
head(ToothGrowth)
```

```
##      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
```

```
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
```

```
ggplot(data=ToothGrowth, aes(x=as.factor(dose), y=len, fill=supp)) +
  geom_bar(stat="identity") +
  facet_grid(. ~ supp) +
  xlab("Dose(mg)") +
  ylab("Tooth length")
```



hypothesis tests to compare tooth growth by supp and dose.

```
hypothesis1 <- t.test(len ~ supp, data = ToothGrowth)
hypothesis1$conf.int
```

```
## [1] -0.1710156  7.5710156
## attr(,"conf.level")
## [1] 0.95
```

```
hypothesis1$p.value
```

```
## [1] 0.06063451
```

```
hypothesis2<-t.test(len ~ supp, data = subset(ToothGrowth, dose == 0.5))
hypothesis2$conf.int
```

```
## [1] 1.719057 8.780943
## attr(,"conf.level")
## [1] 0.95
```

```
hypoth2$p.value
```

```
## [1] 0.006358607
```

```
hypoth3<-t.test(len ~ supp, data = subset(ToothGrowth, dose == 1))
hypoth3$p.value
```

```
## [1] 0.001038376
```

```
hypoth4<-t.test(len ~ supp, data = subset(ToothGrowth, dose == 2))
hypoth4$conf.int
```

```
## [1] -3.79807  3.63807
## attr(,"conf.level")
## [1] 0.95
```

```
hypoth4$p.value
```

```
## [1] 0.9638516
```

## Conclusions

OJ ensures more tooth growth than VC for dosages 0.5 & 1.0. OJ and VC gives the same amount of tooth growth for dose amount 2.0 mg/day. For the entire trail we cannot conclude OJ is more effective than VC for all scenarios.