

# Week4P2

Ash

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## Q1

```
library(ggplot2)
library(datasets)
colnames(ToothGrowth)
```

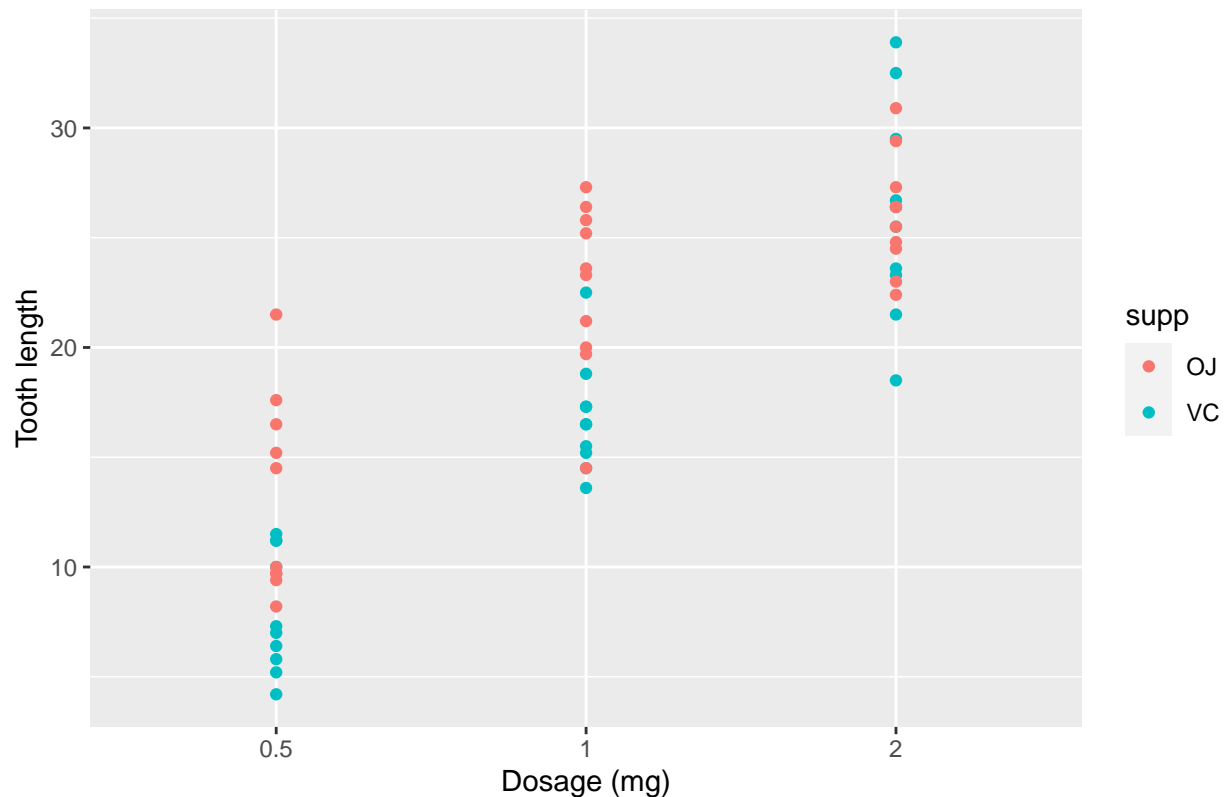
```
## [1] "len" "supp" "dose"
```

```
ToothGrowth$dose <- as.factor(ToothGrowth$dose)
summary(ToothGrowth)
```

```
##      len      supp      dose
## Min.   : 4.20    OJ:30    0.5:20
## 1st Qu.:13.07    VC:30     1 :20
## Median :19.25           2 :20
## Mean   :18.81
## 3rd Qu.:25.27
## Max.   :33.90
```

```
qplot(dose ,len ,data = ToothGrowth,
      col = supp,
      main = "Tooth growth of guinea pigs by supplement type and dosage (mg)",
      xlab = "Dosage (mg)",
      ylab = "Tooth length")
```

Tooth growth of guinea pigs by supplement type and dosage (mg)



Q3

```
VC.length <- ToothGrowth$len[ToothGrowth$supp == "VC"]
OJ.length <- ToothGrowth$len[ToothGrowth$supp == "OJ"]

t.test(OJ.length, VC.length,
       alternative = "greater", # testing hypothesis if OJ is *greater* than VC
       paired = FALSE, # the data point are not paired with each other
       var.equal = FALSE, # the variances are not equal
       conf.level = 0.95) # a 95% confidence interval is taken as the default if nothing else is defined

##
## Welch Two Sample t-test
##
## data: OJ.length and VC.length
## t = 1.9153, df = 55.309, p-value = 0.03032
## alternative hypothesis: true difference in means is greater than 0
## 95 percent confidence interval:
##  0.4682687      Inf
## sample estimates:
## mean of x mean of y
```

## 20.66333 16.96333

## Q4

- There is (at least) a 95% confidence that by increasing the dosage from 0.5 to 1mg and from 1 to 2mg, increases the tooth length.
- There is (at least) a 95% confidence that giving the supplement OJ (Orange Juice) increases tooth length more significantly than giving VC (Vitamin C) Assumptions made are that this sample is representative of the population in question, the assignment for categories was random and that the distribution of the means is normal.