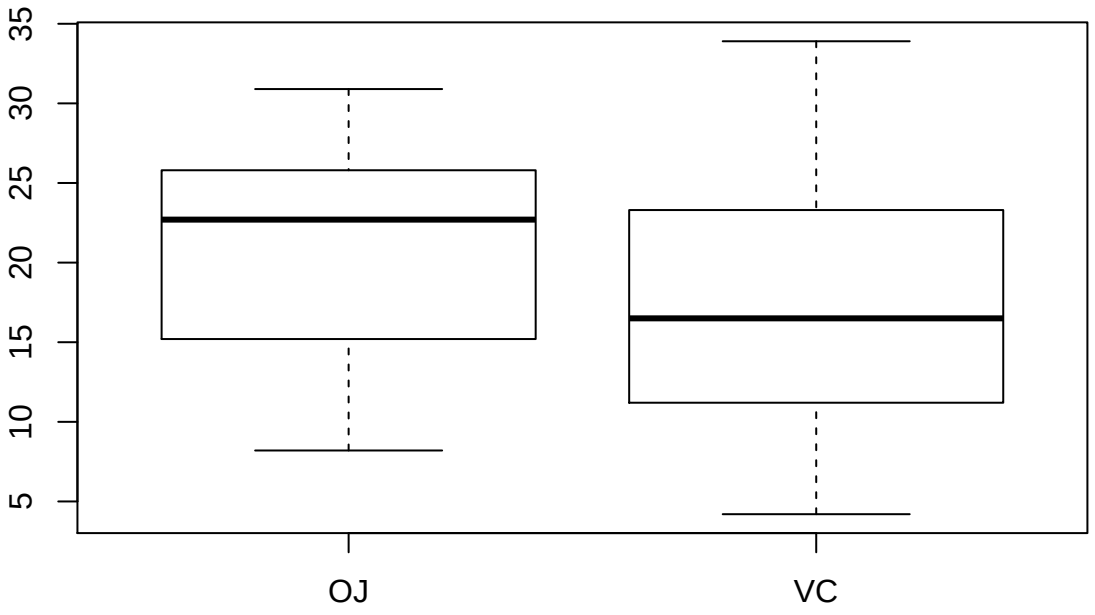
ToothGrowth

1. Load the ToothGrowth data and perform some basic exploratory data analyses

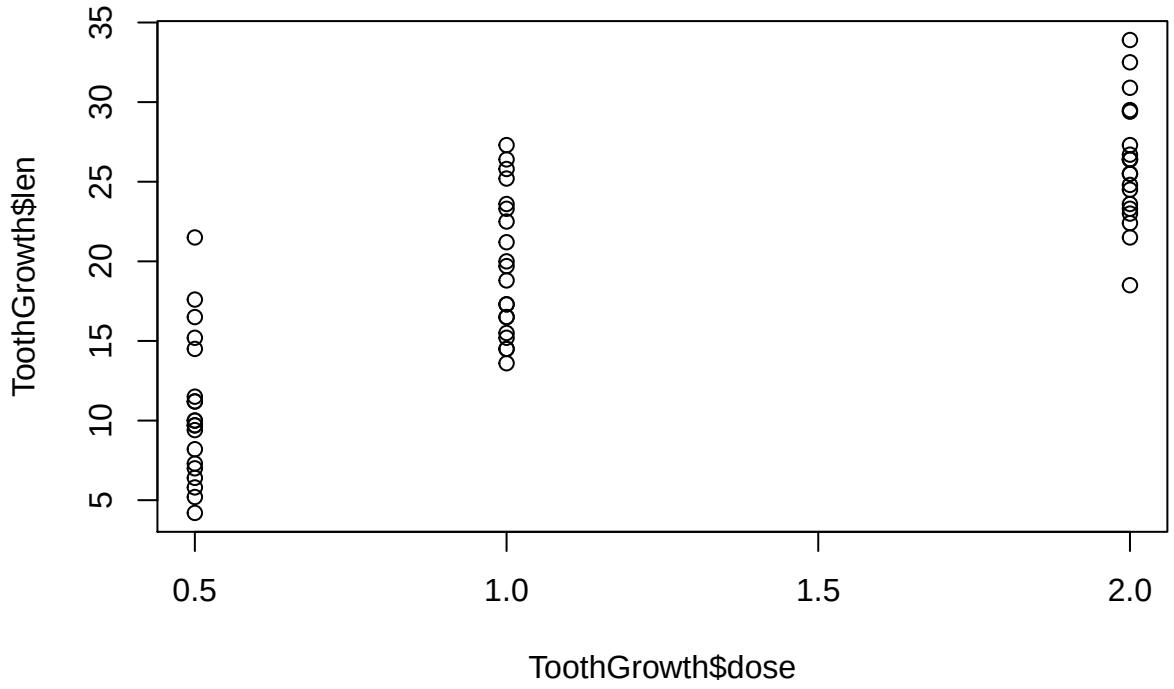
```
data(ToothGrowth)
str(ToothGrowth)
```

```
## '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 ...
```

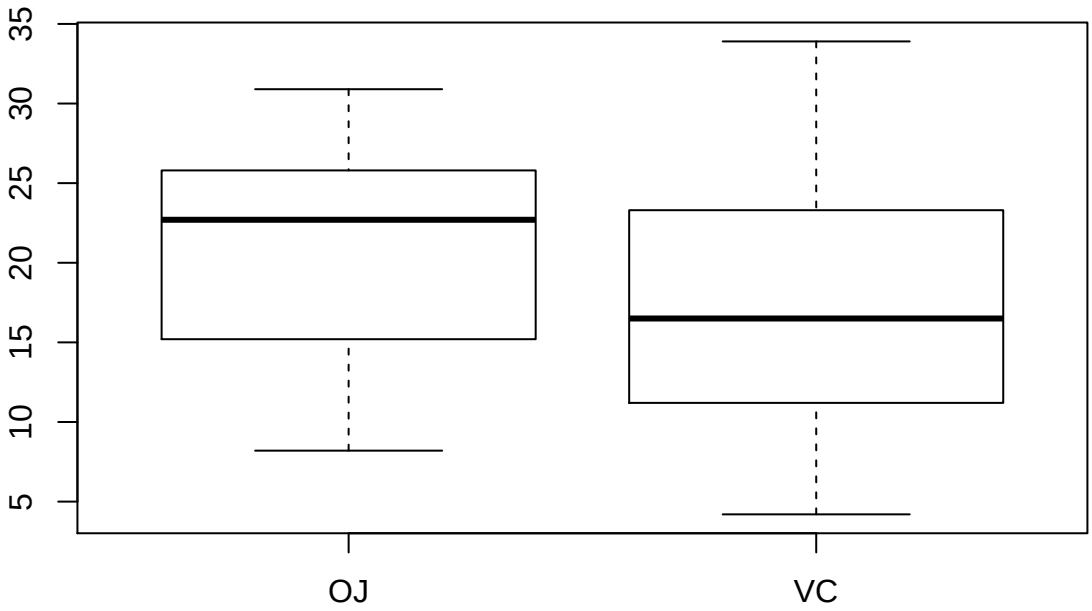
```
boxplot(len~supp,d=ToothGrowth)
```




```
plot(ToothGrowth$dose,ToothGrowth$len)
```




```
plot(ToothGrowth$sup,ToothGrowth$len)
```



2. Provide a basic summary of the data.

```
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
```

```
tapply(ToothGrowth$len,ToothGrowth$sup,mean)
```

```
##       OJ       VC
## 20.66333 16.96333
```

3 .Use confidence intervals and/or hypothesis tests to compare tooth growth by supp and dose.

```
#T test for the difference in mean in pig with VC and OJ.
VC<-subset(ToothGrowth,supp=='VC')
OJ<-subset(ToothGrowth,supp=='OJ')

Sx<-var(VC$len)
Sy<-var(OJ$len)

sp<-sqrt((29*Sx^2 + 29*Sy^2)/(30+30-2))
#Confidence interval for difference in mean of pigs with VC and OJ.
20.66333-16.96333+c(-1,1)*qt(.975,58)*sp*(1/30 + 1/30)^0.5
```

```
## [1] -25.92832  33.32832
```

O is in The confidence interval is in so with a certainty of 95% there is no Statistical difference between the pigs with OR and the pigs with VC.

4. Conclusion and assumptions.

Conclusion: Supplement type does not make a statistical difference in the lenght of pigs.

Assumptions are : *Data from pics is iid normal distribuited.* Pigs with OJ and pigs with VC are from independent groups.