

Tooth Growth Supplement

CJ

Sunday, January 18, 2015

Code Chunks for Tooth Growth.

```
print("Chuck 1")
library(datasets)
data(ToothGrowth)
?ToothGrowth
```

```
## starting httpd help server ... done
```

```
str(ToothGrowth)
```

```
## [1] "Chuck 1"
## '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 ...
```

```
print("Chuck 2")

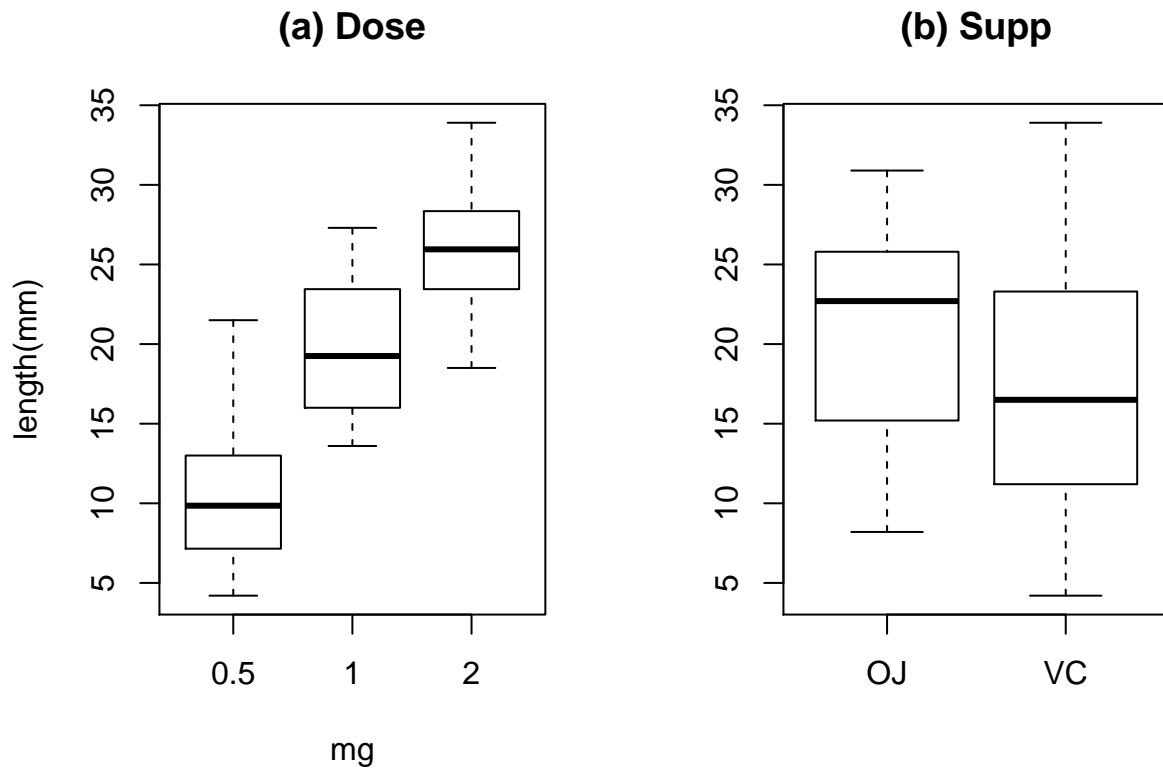
# factorising dose
ToothGrowth$dose <- factor(ToothGrowth$dose)

# summarize the data
summary(ToothGrowth)
with(ToothGrowth, table(dose,supp))

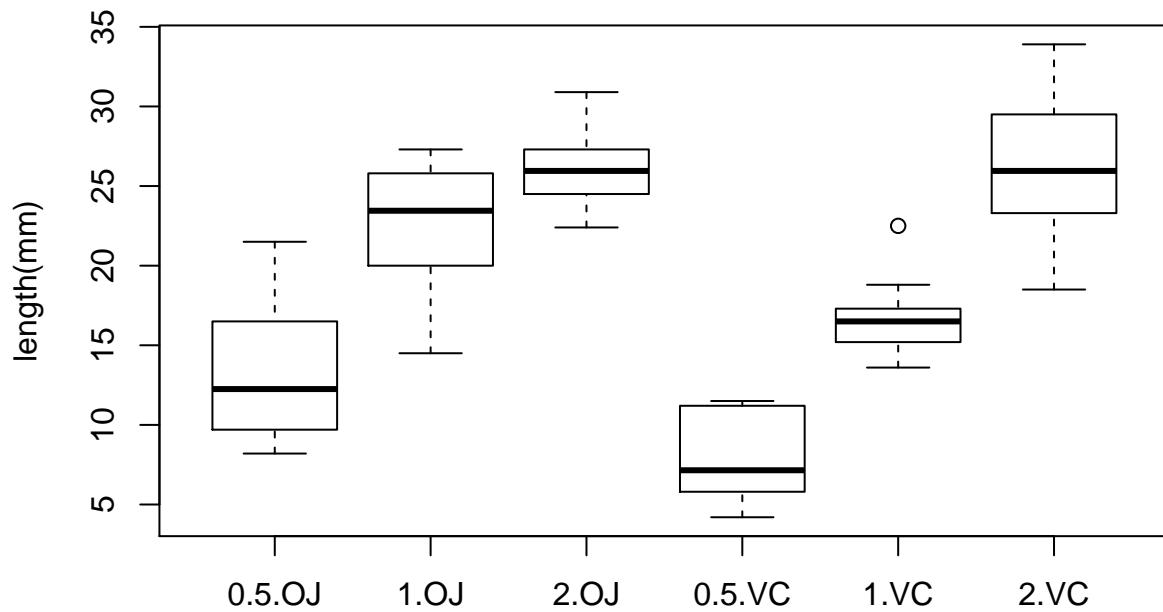
# NA data
print("number of NAs"); sum(is.na(ToothGrowth))
```

```
## [1] "Chuck 2"
##      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
##      supp
## dose OJ VC
## 0.5 10 10
## 1   10 10
## 2   10 10
## [1] "number of NAs"
## [1] 0
```

```
print("Chuck 3")
par(mfrow=c(1,2))
boxplot(len ~ dose, data = ToothGrowth, main="(a) Dose", xlab="mg", ylab="length(mm)")
boxplot(len ~ supp, data = ToothGrowth, main="(b) Supp")
```



```
print("Chuck 4")
par(mfrow=c(1,1))
boxplot(len ~ dose*supp, data = ToothGrowth, ylab="length(mm)")
```



```
## [1] "Chuck 3"
## [1] "Chuck 4"
```

```
print("Chuck 4")
with(ToothGrowth, pairwise.t.test(len,dose, pool.sd=FALSE))
```

```
## [1] "Chuck 4"
##
## Pairwise comparisons using t tests with non-pooled SD
##
## data: len and dose
##
## 0.5      1
## 1 2.5e-07 -
## 2 1.3e-13 1.9e-05
##
## P value adjustment method: holm
```

```
print("Chuck 5")
with(ToothGrowth, t.test(len~supp))
```

```
## [1] "Chuck 5"
##
## Welch Two Sample t-test
```

```
##
## data: len by supp
## t = 1.9153, df = 55.309, p-value = 0.06063
## alternative hypothesis: true difference in means is not equal to 0
## 95 percent confidence interval:
## -0.1710156 7.5710156
## sample estimates:
## mean in group OJ mean in group VC
## 20.66333 16.96333
```

```
print("Chuck 6")
levels <- levels(ToothGrowth$dose);levels

# t-test regarding dose grouped by supp

re <- lapply(1:length(levels), function(i)
  with(ToothGrowth,
    t.test(len[dose==levels[[i]]]~supp[dose==levels[[i]]])
  )
)

lapply(1:3, function(i) re[[i]]$conf.int)
```

```
## [1] "Chuck 6"
## [1] "0.5" "1" "2"
## [[1]]
## [1] 1.719057 8.780943
## attr(,"conf.level")
## [1] 0.95
##
## [[2]]
## [1] 2.802148 9.057852
## attr(,"conf.level")
## [1] 0.95
##
## [[3]]
## [1] -3.79807 3.63807
## attr(,"conf.level")
## [1] 0.95
```