

Investigating Tooth Growth by supplement

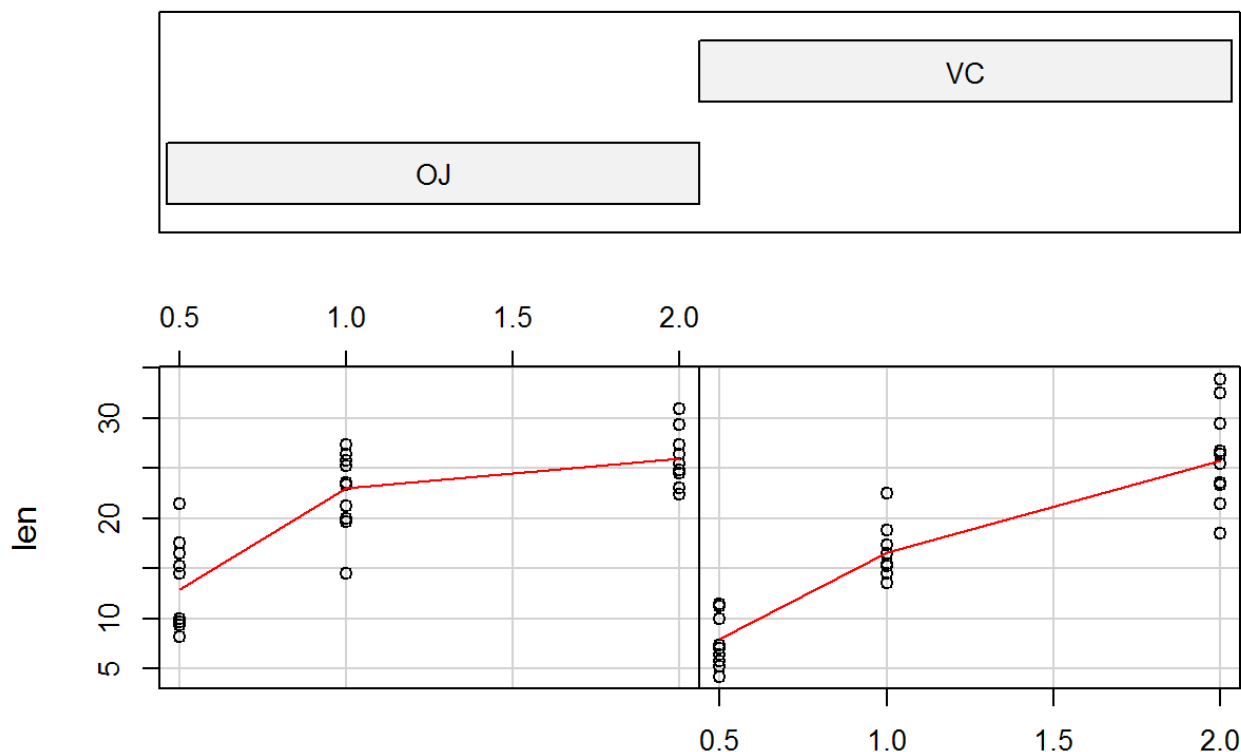
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Exploratory Data

```
coplot(len ~ dose | supp, data = ToothGrowth, panel = panel.smooth,
       xlab = "ToothGrowth data: length vs dose, given type of supplement")
```

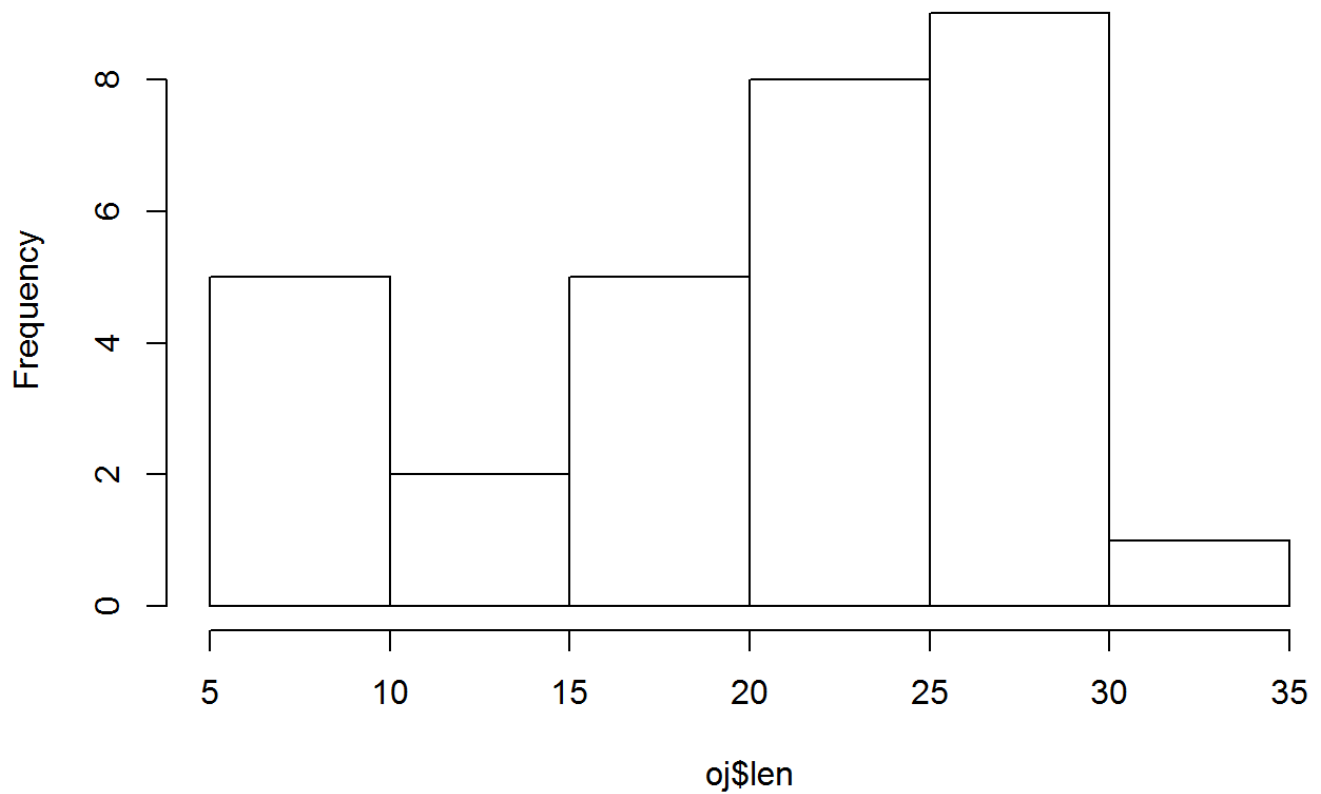
Given : supp



ToothGrowth data: length vs dose, given type of supplement

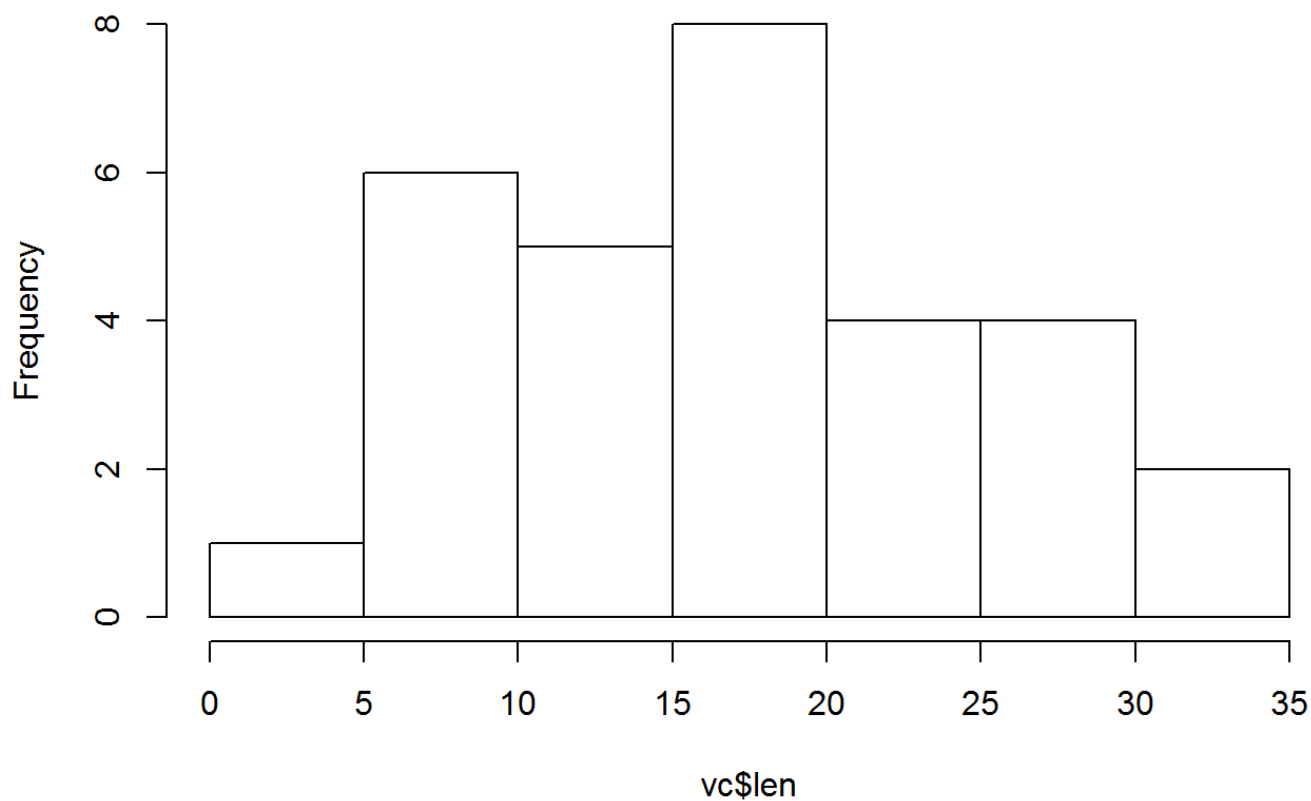
```
oj<-ToothGrowth[ToothGrowth[,2]=="OJ",]
vc<-ToothGrowth[ToothGrowth[,2]=="VC",]
hist(oj$len)
```

Histogram of oj\$len



```
hist(vc$len)
```

Histogram of vc\$len



```
mean(oj$len)
```

```
## [1] 20.66333
```

```
sd(oj$len)
```

```
## [1] 6.605561
```

```
length(oj$len)
```

```
## [1] 30
```

```
mean(vc$len)
```

```
## [1] 16.96333
```

```
sd(vc$len)
```

```
## [1] 8.266029
```

```
length(vc$len)
```

```
## [1] 30
```

Confidence Intervals

The assumption here is that it's normally distributed.

```
ci <- .975
ojci <- mean(oj$len)+c(-1,1)*qnorm(ci)*sd(oj$len)/sqrt(length(oj$len))
vcci <- mean(vc$len)+c(-1,1)*qnorm(ci)*sd(vc$len)/sqrt(length(vc$len))
confidencelevel <- (2*ci-1)*100
```

The 95% for OJ is between 18.2996071 and 23.0270596.

The 95% for Vitamin C is between 14.0054273 and 19.9212393.

```
ci <- .95
ojci <- mean(oj$len)+c(-1,1)*qnorm(ci)*sd(oj$len)/sqrt(length(oj$len))
vcci <- mean(vc$len)+c(-1,1)*qnorm(ci)*sd(vc$len)/sqrt(length(vc$len))
confidencelevel <- (2*ci-1)*100
```

The 90% for OJ is between 18.6796317 and 22.6470349.

The 90% for Vitamin C is between 14.4809804 and 19.4456863.

The assumption here is that it's a poisson distribution.

```
ci <- .95
ojci <- mean(oj$len)+c(-1,1)*pnorm(ci)*sd(oj$len)/sqrt(length(oj$len))
vcci <- mean(vc$len)+c(-1,1)*pnorm(ci)*sd(vc$len)/sqrt(length(vc$len))
confidencelevel <- (2*ci-1)*100
```

The 90% for OJ is between 19.6636229 and 21.6630437.

The 90% for Vitamin C is between 15.7123215 and 18.2143451.

```
ci <- .95
ojci <- mean(oj$len)+c(-1,1)*pnorm(ci)*sd(oj$len)/sqrt(length(oj$len))
vcci <- mean(vc$len)+c(-1,1)*pnorm(ci)*sd(vc$len)/sqrt(length(vc$len))
confidencelevel <- (2*ci-1)*100
```

The 90% for OJ is between 19.6636229 and 21.6630437.

The 90% for Vitamin C is between 15.7123215 and 18.2143451.