Analyse ToothGrowth

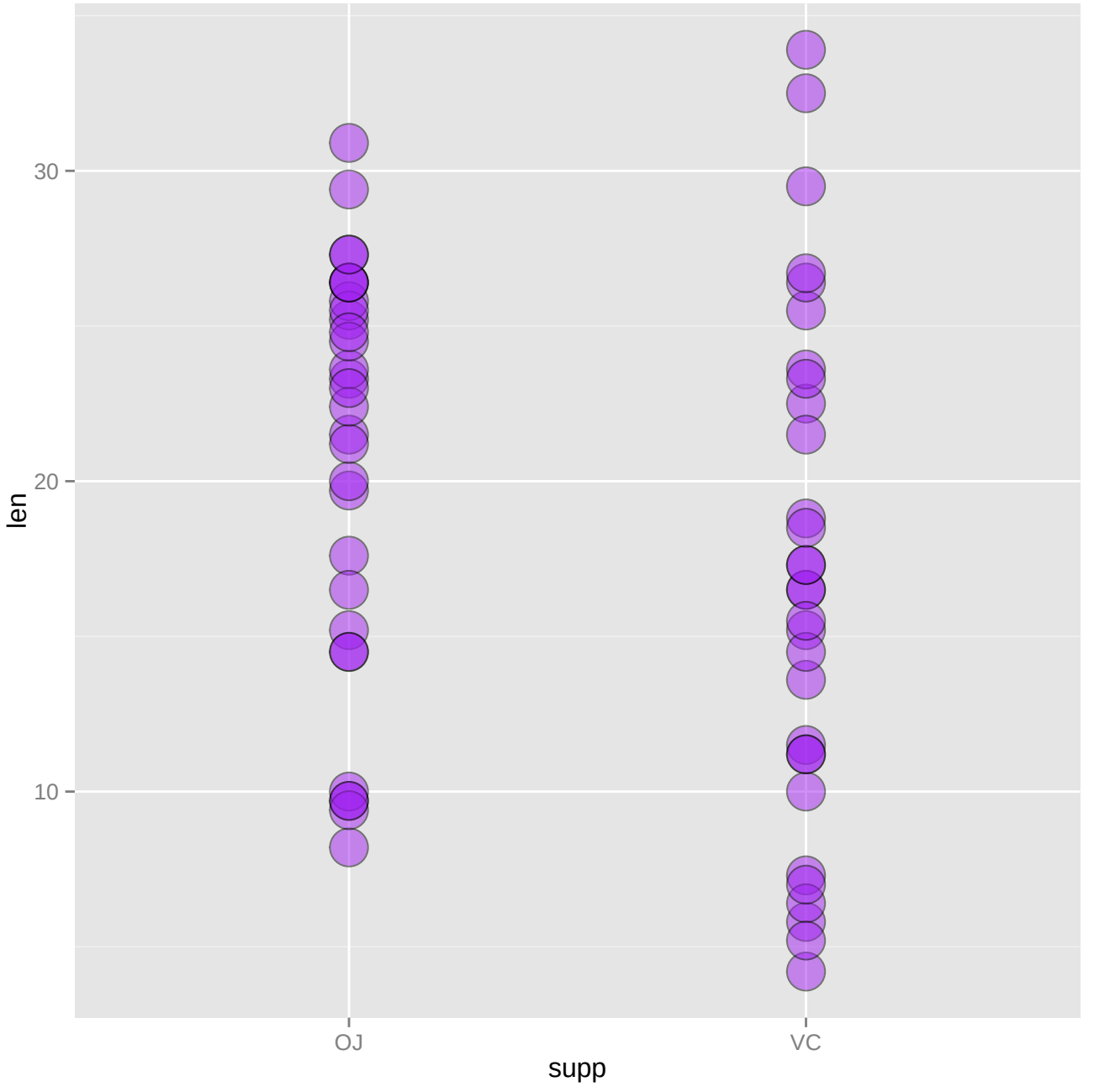
——by Leonardo

R code I used :

```
>pdf("ToothGowth.pdf")
> library(ggplot2)
> g <- ggplot(ToothGrowth, aes(x = supp, y = len, supp = factor(dose)))
> g <- g + geom_point(size =8, pch = 21, fill = "purple", alpha = .5) > g
> dev.off()
```

From the graph (on the next page) , though not very phenomnent, the mean of "OJ" group seems greater than "VC" group whose variance is on the contrast.

My statistical analysis is on page 3.


30
20
10
len
OJ
VC
supp

Represent mean of "OJ" group by MOJ , and mean of "VC" by MVC , and

$$diff = M_{OJ} - M_{VC}$$

So, my null hypothesis is :

$$U_0 : diff = 0$$

alternative hypothesis is :

$$U_1 : diff \neq 0$$

I will use t-test cause the sample size seems not "big enough".

R code :

```
> t.test(len ~ supp, data = ToothGrowth)

        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
```

So, 0 is in the confidence interval, and p-value > 0.05, which gives the ***conclusion*** :

At 0.05 significant level, null hypothesis of ***diff = 0*** can **NOT** be **refused**, which means effect of Vitamin C is undeterminate.