

project1.2

Adit

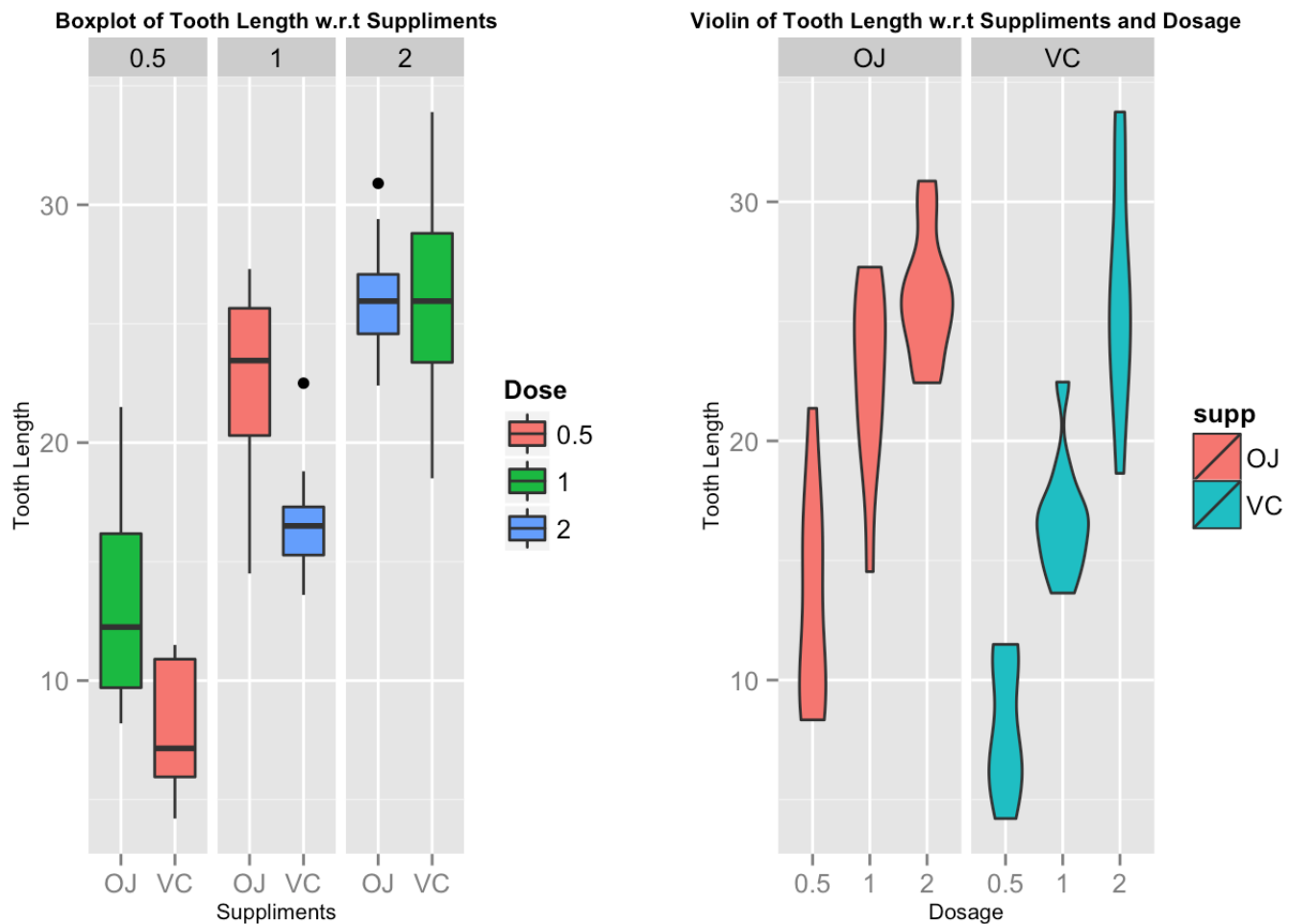
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After loading the data, one can see that there are three variables with 60 observations. 3 levels of dosage - 0.5, 1, 2 and two levels of supplements - OJ (orange juice) and VC (Vitamin C).

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

Below we create a boxplot and a violin plot to understand the variability of the length based on the supplement and dosage.

```
grid.arrange(b1,v1,ncol=2)
```



One can see that there is high variability in the Tooth length based on supplements and dosage. The potential variations are 15 (6C2).

We use the t test to reject the 15 null hypothesis that:

1. As the dosage increases the Tooth Length decreases
2. For the same dosage, VC provides a bigger increase in Tooth Length as compared to OJ.

I have shown a few of the 15 tests below:

#1. OJ@0.5 w.r.t OJ@1

```
h1<-t.test(test1[test1$supp=='OJ'],]$len,test2[test2$supp=='OJ'],]$len,paired = FALSE,var.equal = TRUE)
```

#2. OJ@0.5 w.r.t OJ@2

```
h2<-t.test(test1[test1$supp=='OJ'],]$len,test3[test3$supp=='OJ'],]$len,paired = FALSE,var.equal = TRUE)
```

#3. OJ@1 w.r.t OJ@2

```
h3<-t.test(test2[test2$supp=='OJ'],]$len,test3[test3$supp=='OJ'],]$len,paired = FALSE,var.equal = TRUE)
```

#4. VC@0.5 w.r.t VC@1

```
h4<-t.test(test1[test1$supp=='VC'],]$len,test2[test2$supp=='VC'],]$len,paired = FALSE,var.equal = TRUE)
```

#5. VC@0.5 w.r.t VC@2

```
h5<-t.test(test1[test1$supp=='VC'],]$len,test3[test3$supp=='VC'],]$len,paired = FALSE,var.equal = TRUE)
```

#6. VC@1 w.r.t VC@2

```
h6<-t.test(test2[test2$supp=='VC'],]$len,test3[test3$supp=='VC'],]$len,paired = FALSE,var.equal = TRUE)
```

#7. OJ@0.5 w.r.t VC@0.5

```
h7<-t.test(test1[test1$supp=='OJ'],]$len,test1[test1$supp=='VC'],]$len,paired = FALSE,var.equal = TRUE)
```

#8. OJ@0.5 wr.t VC@1

```
h8<-t.test(test1[test1$supp=='OJ'],]$len,test2[test2$supp=='VC'],]$len,paired = FALSE,var.equal = TRUE)
```

#9. OJ@0.5 wr.t VC@2

```
h9<-t.test(test1[test1$supp=='OJ'],]$len,test3[test3$supp=='VC'],]$len,paired = FALSE,var.equal = TRUE)
```