Appendix

R code of Statistical Inference course project part 2

```
## Part 2
##
library(datasets)
data("ToothGrowth")
w<-aggregate(ToothGrowth$len, by=list(ToothGrowth$supp, ToothGrowth$dose),FUN=mean)
v<-aggregate(ToothGrowth$len, by=list(ToothGrowth$dose, ToothGrowth$supp),FUN=mean)

## These plots compares the effects of orange juice supplement
## and vitamin C supplement on tooth growth.
par(mfcol=c(1,2))
plot(ToothGrowth$dose[which(ToothGrowth$supp=="OJ")],
     ToothGrowth$len[which(ToothGrowth$supp=="OJ")],
     xlab="Dose level (mg/day)", ylab="Tooth growth",
     main="Effect of dose level of orange juice",
     cex.main = 0.8, ylim=c(5,40))
lines(w$Group.2[which(w$Group.1=="OJ")],
      w$x[which(w$Group.1=="OJ")], col="blue")

plot(ToothGrowth$dose[which(ToothGrowth$supp=="VC")],
     ToothGrowth$len[which(ToothGrowth$supp=="VC")],
     xlab="Dose level (mg/day)", ylab="Tooth growth",
     main="Effect of dose level of vitamin C",
     cex.main = 0.8, ylim=c(5,40))
lines(w$Group.2[which(w$Group.1=="VC")],
      w$x[which(w$Group.1=="VC")], col="blue")

## Use t.test to examine the 95% confidence interval of
## assuming that OJ is more effective than VC when 0.5  mg/day dose is used
##
g1<- ToothGrowth[which(ToothGrowth$supp=="OJ" & ToothGrowth$dose == 0.5),]
g2<- ToothGrowth[which(ToothGrowth$supp=="VC" & ToothGrowth$dose == 0.5),]
t.test(g1$len, g2$len, paired = F, var.equal = F)$conf

## Use t.test to examine the 95% confidence interval of
## assuming that OJ is more effective than VC when 1 mg/day dose is used
##
g1<- ToothGrowth[which(ToothGrowth$supp=="OJ" & ToothGrowth$dose == 1),]
g2<- ToothGrowth[which(ToothGrowth$supp=="VC" & ToothGrowth$dose == 1),]
t.test(g1$len, g2$len, paired = F, var.equal = F)$conf

## Use t.test to examine the 95% confidence interval of
## assuming that OJ is more effective than VC when 2 mg/day dose is used
##
g1<- ToothGrowth[which(ToothGrowth$supp=="OJ" & ToothGrowth$dose == 2),]
g2<- ToothGrowth[which(ToothGrowth$supp=="VC" & ToothGrowth$dose == 2),]
t.test(g1$len, g2$len, paired = F)$conf
```

```
## From each individual supplement, the plot shows and upward trend
## in tooth growth when the supplement dose level is increased.
##
## Orange juice dose 1 and 0.5
g1<- ToothGrowth[which(ToothGrowth$supp=="OJ" & ToothGrowth$dose == 1),]
g2<- ToothGrowth[which(ToothGrowth$supp=="OJ" & ToothGrowth$dose == 0.5),]
t.test(g1$len, g2$len, paired = F)$conf

## Orange juice dose 2 and 1
g1<- ToothGrowth[which(ToothGrowth$supp=="OJ" & ToothGrowth$dose == 2),]
g2<- ToothGrowth[which(ToothGrowth$supp=="OJ" & ToothGrowth$dose == 1),]
t.test(g1$len, g2$len, paired = F)$conf

## VC dose 1 and 0.5
g1<- ToothGrowth[which(ToothGrowth$supp=="VC" & ToothGrowth$dose == 1),]
g2<- ToothGrowth[which(ToothGrowth$supp=="VC" & ToothGrowth$dose == 0.5),]
t.test(g1$len, g2$len, paired = F)$conf

##VC dose 2 and 1
g1<- ToothGrowth[which(ToothGrowth$supp=="VC" & ToothGrowth$dose == 2),]
g2<- ToothGrowth[which(ToothGrowth$supp=="VC" & ToothGrowth$dose == 1),]
t.test(g1$len, g2$len, paired = F)$conf
```