These questions will help you review the material we have learned up to this point in the semester.

Consider the ToothGrowth dataset in R.

> ?ToothGrowth

Say a researcher was interested in obtaining guinea pigs with long teeth (yes, that is an odd interest). They want to know which Vitamin C delivery method (OJ or VC) and which dosage level (0.5, 1.0, or 2.0) would result in the longest teeth, on average. Say they produce the following plot:

> xyplot(len ~ dose, groups=supp, data=ToothGrowth, type=c("p","a"), auto.key=TRUE)

and reach the following conclusion:

"I have decided to use a dosage of 2.0. The delivery method at this dosage does not seem to matter. Both delivery methods result in the same average tooth growth at this highest dosage level even though at lower levels of dosage the OJ delivery method tends to yield longer teeth on average."

Run an appropiate hypothesis test in R to determine if the researcher is justified in reaching their conclusion from the above plot.

Most appropriate hypothesis test for these data: Two-Way ANOVA

Test statistic for this test: 4.083142

Degrees of Freedom for this test: 2 and 54

P-value for this test: 0.024631

Is the reasercher justified in their conclusion?

- (●) Yes
- ( ) No

Consider the RailTrail dataset in R. (Be sure library(mosaicData) is loaded.)

> ?RailTrail

Say a student feels that it is typically more cloudy on weekends than it is on weekdays. They decide to use the RailTrail dataset to test the null hypothesis that weekends and weekdays have equal average cloudiness ratings (0 - 10 scale). They produce the following plot:

> boxplot(cloudcover ~ weekday, data=RailTrail, names=c("Weekend/Holiday", "Weekday"), ylab="Cloud Cover Measurement (in oktas)")

Definition: oktas (https://en.wikipedia.org/wiki/Okta)

and reach the conclusion that weekdays are actually more cloud covered than weekends.

Run an appropiate hypothesis test in R to determine if the student is justified in reaching their conclusion from the above plot.

Most appropriate hypothesis test for these data: Independent Samples t Test

Test statistic for this test: -1.7358

Degrees of Freedom for this test: 48.435

P-value for this test: .08895

Is the student justified in their conclusion at the 0.1 significance level?

- (●) Yes
- ( ) No