1. LAST TIME ON STAT 371H
    a. The Milk Price case study
2. THIS TIME ON STAT 371H
    a. More Milk Price case study
    b. Consistent problems
        i. Unclear path to the answer. You're frustrated. That's OK.
        ii. Think about it two ways
            1. Bottom up – data description and up
            2. Top down – principle on down to the data
                a. Maximize profit
                    i. Profit = revenue – expenses
                    ii. Profit = (revenue per unit – expenses per unit)(units sold)
                    iii. Profit = (price per unit – Expenses per unit)(units sold)
                        1. Price is a given
                        2. Units sold is given
                    iv. Profit =(Price per unit – expenses Per Unit)(function(price))
                b. What can we control: price per gallon
    c. Post mortem on the case study
        i. See attached code walk through
3. Video Games
    a. Our cognitive/visual systems are complicated, but easily switched
    b. Man/liar drawing
    c. Points vs. man in motion
    d. Which line is longest?
    e. Which color is brighter?
        i. THEY'RE THE SAME
        ii. INCEPTION
    f. Video game folks understand these things – they have to to make a believable world.
        i. NOW WE HAVE THAT DATA (cut to R walk through)
4. Case Study!!
    a. Two important dummy variables
        i. Far away
        ii. Littered
        iii. Need to understand the way they BOTH influence the data – see attached code walk through

MILK CASE STUDY

```
library(mosaic)
plot(sales~price, data=milk)

lm1 = lm(sales ~ price + I(price^2) , data = milk)

points(fitted(lm1)~price, data=milk, col='pink', pch=19)

mean(resid(lm1))

revenue = milk$sales*milk$price

plot(revenue~price, data=milk)

lm2=lm(revenue~price, data=milk)

abline(lm2)

resid(lm2)

#Profits calculation = (price/unit -
expense/unit)(Function(price))
profitper = milk$price-1.29

milk = cbind(milk, profitper)

plot(profitper*sales~price, data=milk)

lm3 =  lm(profitper*sales~price + I(price^2) , data = milk)

points(fitted(lm3)~price, data=milk, col='red', pch=19)

#Answer appears to be around $3.20-$3.40

#The other way
#power log model
#Sales=(e^4.72)(price^-1.6)
#profit=(price-1)*e^4.72*price^-1.6

curve((x-1)*exp(4.72)*x^(-1.6) from=1,6)
curve1=curve((x-1)*exp(4.72)*x^(-1.6) from 1, to=6)
```

REACTION TIME WALKTHROUGH

```
library(mosaic)

rxntime = read.csv('rxntime.csv')
summary(rxntime)

#littered as a dummy
lm1 = lm(PictureTarget.RT ~ Littered, data=rxntime)
coef(lm1)
#littered scenes take 88 seconds longer or so

#Now we need to add the second variable
lm2 = lm(PictureTarget.RT ~ Littered + FarAway,
data=rxntime)
coef(lm2)

#now we have the two offsets
#yhat = beta(0)+beta(1)(1/0(littered))
+beta(2)(1/0(faraway))
#so plug in 1/0 for those variables to get the yhat for any
combination of littered/far away
#this assumes that these two effects are seperable (i.e.
Main effects only)
#BUT if there is an interaction, we add a third beta (see
below)
  #orginial equation above +beta(3)*(1[littered])*(1[far
away])
# if neither of them occur you don't see their influence
```