**Agenda**

1. Interpreting simple linear regression coefficients
2. Residuals
3. Conditions for regression
4. Outliers– leverage and influence

**Interpreting coefficients** Let's look at at example model, using the Cereal data that will be on HW2.

```
require(mosaic)
require(Stat2Data)
data(Cereal)
m1 <- lm(Calories~Sugar, data=Cereal)
coef(m1)

## (Intercept)       Sugar
##   87.427690    2.480813
```

How can we interpret the intercept in this model? The slope?

**Residuals**

- Residuals: $y - \hat{y}$

$$SSE = \sum_{i=1}^{n} (y - \hat{y})^2, \qquad \hat{\sigma}_\epsilon = \sqrt{\frac{SSE}{n-2}}$$

- Least Squares: technique for minimizing SSE
- Finds *unique* straight line between scatterplot of points

**Conditions for regression**

- **L**inearity:
- **I**ndependence:
- **N**ormality of Residuals:

- **E**qual Variance of Residuals:

The LINE conditions are the same as the conditions from the book, just differently stated.

**Transformations** What if the assumptions for regression are not met? Apply transformations! This process is as much art as science... The most common transformation to apply is a log transformation.

**Leverage and influence** Not all outliers have high leverage!

**Lab** Let's dive into an example, building from our previous lab.