March 9, 2011
It is E370 Time!!!

- ❑ Announcements
  - ✓ Team Project Part Two – Variable Descriptions and Relationships is due in lab, March 24 or 25, the week after Spring Break.
  - ✓ Please email me if you WILL ATTEND the Concept Map meeting scheduled for this Friday, 3:00 to 4:30 PM.
  - ✓ Check your email before going to Sunday evening CL on March 20. There is some talk about cancelling CL because that day is technically part of Spring Break.
  - ✓ Remember, the Stigler lecture Thursday afternoon!
- ❑ A couple of questions to get you thinking:
- ❑ Jimmy Johns counted the number of customers in the store weekdays between noon and 1:00 for a sample of 100 days. The standard deviation is 50. How likely is it that the sample mean number of customers will be within 10 customers of the population mean?
- ❑ The standard deviation of a test is about 12 points. For a random sample of 36 students, how likely is it that the sample mean will differ from the population mean by more than 6 points?
- ❑ The standard deviation of spending on food at the movies is $1.08. For a random sample of 81 moviegoers, how likely is it that the sample mean spending will be more than 24 cents above the population mean?

- ❑ What will we do today?
  - ✓ Practice using sampling distributions.
  - ✓ Consider the case of the sample proportion.
  - ✓ Practice using the sample proportion and its distribution.
  - ✓ Compare "standard deviations" to "standard errors."
  - ✓ Review standard error formulas and determine when each is used.
  - ✓ Practice recognizing random variables and figuring out their distributions.
  - ✓ Figure out how to figure out random variables and their distributions.

- ❑ In your teams: Using your knowledge of linear combinations, if the sample proportion, p, is defined as X/n, when X is a binomial random variable, what is the expected value and the expected variance of p?

$$p = \frac{X}{n}$$

- ❑ A recent Gallup poll talked with 500 adult Americans and reported that 20% of them said they believe in reincarnation. Describe the distribution of the sample proportion for samples of this size.

- Standard Deviations
  - ✓ $\sigma_X = \sqrt{\frac{\sum (X_i - \mu)^2}{N}}$
  - ✓ $s_X = \sqrt{\frac{(X_i - \bar{X})^2}{n-1}}$
  - ✓ $\sigma_X = \frac{b-a}{\sqrt{12}}$
  - ✓ $\sigma_X = \sqrt{n * \pi * (1-\pi)}$
  - ✓ $\sigma_X = \sqrt{\sum (X_i - E(X))^2 * P(X_i)}$
- Standard Errors
  - ✓ $\sigma_{\bar{X}} = \frac{\sigma_X}{\sqrt{n}}$
  - ✓ $\sigma_{\bar{X}} = \frac{s_X}{\sqrt{n}}$
  - ✓ $\sigma_p = \sqrt{\frac{\pi * (1-\pi)}{n}}$
  - ✓ $\sigma_p = \sqrt{\frac{p * (1-p)}{n}}$