STAT 270 Lecture 32
Fall 2015
25 November 2015

- I started on confidence intervals.
- I did two sample CI's for differences in two population proportions or difference between two population means.
- The relevant slides in "Inference for 2 Samples" are 3-7, 11-12, 15-19.
- Relevant problems: 7.01, 7.05, 7.07, 7.08, 7.10d.
- Handwritten slides.
- Key jargon, ideas:
  - Confidence intervals have form:

    $$\text{estimate} \pm \text{multiplier} \times \text{est'd SE}.$$

  - For a difference between 2 population proportions: estimate is $\hat{p}_1 - \hat{p}_2$ the sample difference, multiplier from normal tables, Estimated SE is $\sqrt{\hat{p}_1(1-\hat{p}_1)/n + \hat{p}_2(1-\hat{p}_2)/m}$.
  - For a difference between 2 population means in 2 large samples: estimate is $\bar{X} - \bar{Y}$, multiplier from normal tables, Estimated SE is
  - For a difference between 2 population means, small samples, *normally distributed populations*: estimate is $\bar{X}$, multiplier from t tables, Estimated SE is $\sqrt{s_X^2/n + s_Y^2/m}$. Degrees of freedom from Satterthwaite approximation.
  - If two population SDs equal in previous point can pool to estimate SE:

    $$s_{\text{pooled}} = \sqrt{\frac{(n-1)s_X^2 + (m-1)s_Y^2}{n+m-2}}$$

    and estimated standard error is

    $$s_{\text{pooled}}\sqrt{\frac{1}{n} + \frac{1}{m}}$$

    Then use $n+m-2$ degrees of freedom. Do that for exams; comment if SDs too different.
  - Two statistics L and U are a 95% CI for a parameter θ if

    $$P(L \le \theta \le U) = 0.95$$

    for all θ.
  - These formulas require independent random samples from 2 populations.