STAT 270 Lecture 28
Fall 2015
16 November 2015

- I discussed sampling distributions.
- I presented general formulas for the variance of a sum.
- I have finished slide 82 of "Continuous Distributions".
- No good problems today.
- Handwritten slides.
- Key jargon, ideas:
  - When you select a sample and compute a summary statistic the result is a random variable.
  - So it has a density or pmf called its "sampling distribution".
  - Many sampling distributions are approximately normal.
  - So you need variance formulas to find SDs.
  - Key formula

$$\begin{aligned}\mathrm{Var}\left(\sum_{i=1}^{n} a_i X_i\right) &= \mathrm{Cov}\left(\sum_{i=1}^{n} a_i X_i, \sum_{j=1}^{n} a_j X_j\right) \\ &= \sum_{i=1}^{n}\sum_{j=1}^{n} a_i a_j \mathrm{Cov}(X_i, X_j) \\ &= \sum_{i=1}^{n} a_i^2 \mathrm{Var}(X_i) + 2\sum_{i<j} a_i a_j \mathrm{Cov}(X_i, X_j).\end{aligned}$$