STA 13A
Seventh Week Discussion

Liwei Wu

Review on materials covered

Some Important terminology last week

- parameter, sample statistic, sampling distribution
- central limit theorem
- sampling distribution of $\bar{x}$: $\mu_{\bar{x}} = \mu$, $\sigma^2_{\bar{x}} = \sigma^2/n$
- target parameter
- point estimator, interbal estimator (or confidence interval)
- confidence level
- large-sample $100(1-\alpha)\%$ confidence interval for μ: use normal statistic z
  σ **known**: $\bar{x} \pm (z_{\alpha/2})(\sigma/\sqrt{n})$
  σ **unknown**: $\bar{x} \pm (z_{\alpha/2})(s/\sqrt{n})$
- small-sample $100(1-\alpha)\%$ confidence interval for μ: use Student t-statistic
  σ **unknown**: $\bar{x} \pm (t_{\alpha/2})(s/\sqrt{n})$
  σ **known & population approximately normal**: $\bar{x} \pm (z_{\alpha/2})(\sigma/\sqrt{n})$
- large-sample $100(1-\alpha)\%$ confidence interval for p: use normal statistic z if $n\hat{p} \geq 15$ & $n\hat{q} \geq 15$

$$\hat{p} \pm z_{\alpha/2}\sqrt{\frac{\hat{p}\hat{q}}{n}}$$

- adjusted $100(1-\alpha)\%$ confidence interval for p:

$$\tilde{p} \pm z_{\alpha/2}\sqrt{\frac{\tilde{p}(1-\tilde{p})}{n+4}}$$

  where $\tilde{p} = \frac{x+2}{n+4}$
- determination of sample size for $100(1-\alpha)\%$ confidence interval for μ

$$n = \frac{((z_{\alpha/2})^2\sigma^2}{(SE)^2}$$

  Note that σ can be estimated by the sample standard deviation or by $R/4$ where R is sample Range

- determination of sample size for $100(1-\alpha)\%$ confidence interval for p

$$n = \frac{((z_{\alpha/2})^2(pq)}{(SE)^2}$$

Some Typical Questions

- Refer to Textbook 4.162, 5.26, 5.38, 5.64, 5.90
- Questions on homework if you have any!!! If not, that is the end of class :)