Exam 1 Practice Solutions

Econ B2000, MA Econometrics

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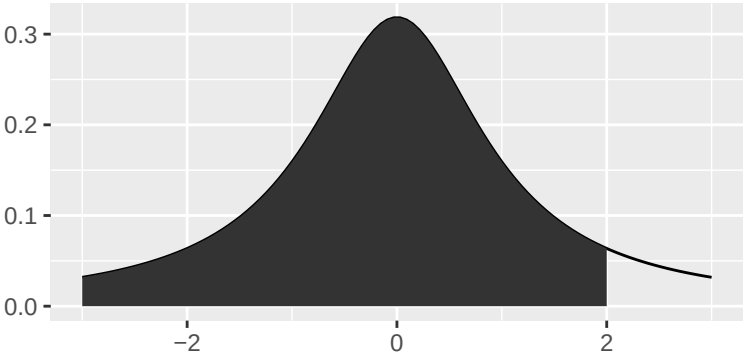
Contents



Using the Normal and Student's T to find p-values

What will be helpful in this section: `pnorm`, `qnorm`, `pt`, `qt`, and a normal distribution / students t distribution graph to visualize. 2 ways to do it. 1) You can calculate the z score. $z = \frac{\bar{x}-\mu}{\sigma}$, or specify mean and sd in the function itself. pnorm and pt default to the lower tail.

Statistics from given numbers (no datasets in R required)

Population Mean

These assume an unknown sigma

$$E = (t_{\alpha/2})\frac{s}{\sqrt{n}} \qquad df = n - 1 \qquad t = \frac{\bar{x} - \mu}{\frac{s}{\sqrt{n}}}$$

Population proportion

$$E = z_{\alpha/2}\sqrt{\frac{\hat{p}(1-\hat{p})}{n}} \qquad z = \frac{\hat{p} - p}{\sqrt{\frac{p(1-p)}{n}}} \qquad n = p(1-p)\left(\frac{z_{\alpha/2}}{E}\right)^2$$

Difference in population means

These assume variances are different and unknown

$$E = t_{\alpha/2}\sqrt{\frac{s_1^2}{n_1} + \frac{s_2^2}{n_2}} \qquad df = min(n_1, n_2) - 1 \qquad t = \frac{(\bar{x}_1 - \bar{x}_2) - (\mu_1 - \mu_2)}{\sqrt{\frac{s_1^2}{n_1} + \frac{s_2^2}{n_2}}}$$

Difference in population proportions

$$E = z_{\alpha/2}\sqrt{\frac{\hat{p}_1(1-\hat{p}_1)}{n_1} + \frac{\hat{p}_2(1-\hat{p}_2)}{n_2}} \qquad \bar{p} = \frac{x_1 + x_2}{n_1 + n_2} \qquad z = \frac{(\hat{p}_1 - \hat{p}_2) - (p_1 - p_2)}{\sqrt{\bar{p}\,(1-\bar{p})\left(\frac{1}{n_1} + \frac{1}{n_2}\right)}}$$

Regression Analysis from given data (no datasets in R required)

Statistics using Datasets (R required)

Regression Analysis using Datasets (R Required)