Lab 09

PH142 Fall 2025

Announcements

- **Lab 9:** due 11/7 at 11:59pm

- **Quiz 8:** due 11/7 at 11:59pm

Week 11 Lecture Review

One Sample Proportion Test

Goal: To test if a population proportion equals a claimed value

Assumptions:
- SRS with independent observations
- Sampling distribution is normal ($np_0 \geq 10$ and $n(1 - p_0) \geq 10$)

Week 11 Lecture Review

One Sample Proportion Test

Hypotheses:
$$H_0 : p = p_0$$
$$H_a : p \neq p_0 \ (\text{or} < \text{or} >)$$

Test Statistic:
$$z = \frac{\hat{p} - p_0}{\sqrt{\frac{p_0(1-p_0)}{n}}}$$

Week 11 Lecture Review

One Sample Proportion Test

Large Sample Method: $\quad \hat{p} \pm z^* \sqrt{\dfrac{\hat{p}(1 - \hat{p})}{n}}$

Plus Four Method: $\quad \tilde{p} = \dfrac{\text{number of successes} + 2}{n+4}$

$$\tilde{p} \pm z^* \sqrt{\dfrac{\tilde{p}(1 - \tilde{p})}{n + 4}}$$

Week 11 Lecture Review

Two Sample Proportion Test

Goal: To test if two population proportions are the same or different.

Assumptions:
- SRS from each independent population
- Sampling distribution is normal (observed successes and failures are > 10 for both samples)

Week 11 Lecture Review

Two Sample Proportion Test

Hypotheses: $H_0 : p_1 - p_2 = 0$
$H_a : p_1 - p_2 \neq 0 \text{ (or } < \text{ or } >)$

Test Statistic: $z = \dfrac{\hat{p}_1 - \hat{p}_2}{\sqrt{\hat{p}(1-\hat{p})\left(\frac{1}{n_1} + \frac{1}{n_2}\right)}}$

Week 11 Lecture Review

One Sample Proportion Test

Large Sample Method: $(\hat{p}_1 - \hat{p}_2) \pm z^* \sqrt{\dfrac{\hat{p}_1(1 - \hat{p}_1)}{n_1} + \dfrac{\hat{p}_2(1 - \hat{p}_2)}{n_2}}$

Plus Four Method:

$$\tilde{p}_1 = \frac{\text{no. of successes in pop1} + 1}{n_1 + 2}$$

$$\tilde{p}_2 = \frac{\text{no. of successes in pop2} + 1}{n_2 + 2}$$

$$(\tilde{p}_1 - \tilde{p}_2) \pm z^* \sqrt{\frac{\tilde{p}_1(1 - \tilde{p}_1)}{n_1 + 2} + \frac{\tilde{p}_2(1 - \tilde{p}_2)}{n_2 + 2}}$$

LAB 09 Walkthrough

Lab Submission

- Follow the directions on the LAB09 file
- Submit using the **Terminal Tab** (next to the console in the bottom left pane)
  - Copy and paste the given line into the terminal
  - Follow prompts (NOTE: the terminal will **not** show your password being typed out!)
- **<u>CHECK IN GRADESCOPE THAT ALL YOUR TESTS PASSED</u>**