LAB 08

PH142 Fall 2025

Announcements

- **Lab 8:** due 11/3 at 11:59pm (extended to Monday)
- **Quiz 7:** due 11/3 at 11:59pm (extended to Monday)

Midterm 2

- **Date:** Friday, October 31st
- **Time:** 8:10-9:00AM, arrive no later than 8:00AM
- **Location(s):** Wheeler, Stanley, Dwinelle
  - Same room assignments as Midterm 1
- **Material Covered:** Lectures 11-22, Lab 4-7

What to Bring

- **Student ID**
- **Pencil/Pen**
- **Cheat Sheet** (single sided, handwritten, 8.5x11”)
- **Scientific Calculator** (non-graphing)

Week 9 Lecture Review

t-tests

- One-sample
- Two-sample
- Paired

Week 9 Lecture Review

One Sample t-test

Goal: To test whether the mean of the sample is different than the mean of the population

Assumptions:

- SRS with independent observations
- Population follows a Normal distribution

Week 9 Lecture Review

One Sample t-test

Hypotheses:

$$H_0 : \mu = \mu_0$$

$$H_A : \mu \neq \mu_0, \text{ or } \mu < \mu_0, \text{ or } \mu > \mu_0$$

Test Statistic:

$$t = \frac{\bar{x} - \mu_0}{s/\sqrt{n}}$$

Week 9 Lecture Review

Two Sample t-test

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

Assumptions:

- SRS with independent observations
- Both populations follow a Normal distribution

Week 9 Lecture Review

Two Sample t-test

Hypotheses:

$$H_0 : \mu_1 - \mu_2 = 0$$
$$H_a : \mu_1 - \mu_2 \neq 0 \ (\text{or} < \text{or} >)$$

Test Statistic:

$$t = \frac{(\bar{x}_1 - \bar{x}_2) - (\mu_1 - \mu_2)}{\sqrt{\frac{s_1^2}{n_1} + \frac{s_2^2}{n_2}}}$$

Week 9 Lecture Review

Paired t-test

Goal: To test if there is a difference in means for the *same* individual at *different* points in time

Assumptions:

- SRS with matched observations
- *Differences* follow a Normal distribution

Week 9 Lecture Review

Paired t-test

Hypotheses:

$$H_0 : \mu_d = 0$$

$$H_A : \mu_d \neq 0, \text{ or } \mu_d < 0, \text{ or } \mu_d > 0$$

Test Statistic:

$$t = \frac{\bar{x}_d - \mu_d}{s_d / \sqrt{n}}$$

LAB 08 Walkthrough

Lab Submission

- Follow the directions on the LAB08 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!)
- **CHECK IN GRADESCOPE THAT ALL YOUR TESTS PASSED**