Homework 5

PSC-103B

YOUR NAME HERE

2025-02-13

Important reminders:

- Do not insert your answer as comments inside a code chunk. They will be cut out when rendered as pdf.
- Instead, enter your answer as plain text after the '>'.
- Check your compiled document before submission to ensure your answers are displayed correctly.

---

1. We'll be using the observed frequencies that we used in lab of Fall 2022 enrollment across the different colleges of UC Davis. I have repeated this information below:

College	Observed Frequency
College of Letters & Sciences	417
College of Agricultural and Environmental Sciences	223
College of Biological Sciences	216
College of Engineering	144
Total	1000

Suppose we were interested in conducting a goodness-of-fit test to determine whether enrollment in these colleges matches the proportions observed in 1993. Here are the frequencies that were observed in 1993.

College	Observed Frequency
College of Letters & Sciences	465
College of Agricultural and Environmental Sciences	223
College of Biological Sciences	191
College of Engineering	121
Total	1000

What proportion of students were enrolled in each college in 1993? (1 point)

- $P_{CLAS} =$
- $P_{CAES} =$
- $P_{CBS} =$
- $P_{CoE} =$

2. Use the probabilities of Question 1 to write the null and alternative hypotheses for the Goodness-of-Fit test (2 points).

H_0 :

H_1 :

3. What are the expected frequencies? (1 point)

- $E_{CLAS} =$
- $E_{CAES} =$
- $E_{CBS} =$
- $E_{CoE} =$

4. Conduct the chi-square goodness-of-fit test in R. Show your code and output (1 points).

5. Do you reject or fail to reject the null hypothesis? Does 2022 enrollment in the different colleges match the proportions of 1993? (1 points)

6. Now suppose we were interested in whether students' choice of college was related to how long it took them to graduate. The frequencies from the 2015 cohort are provided in a table below.

Graduated at	CLAS	CA&ES	CBS	COE	Total
3 years or less	72	30	28	5	135
4 years	1238	677	803	444	3162
5 years	378	216	329	243	1166
6 years	51	43	38	482	614
Total	1739	966	1198	1174	5077

What are the null and alternative hypotheses for the test of independence? (2 points)

H_0 :

H_1 :

7. Conduct the chi-square test of independence. Show your code and output (1 points).

8. Do you reject or fail to reject the null hypothesis? What does this lead you to conclude about time to graduation and college? (1 points)