

1. An engineering education researcher wishes to determine whether there is a difference in the proportion of women enrolled in each of two engineering majors at U.S. colleges. She collects the following data from two random samples of U.S. college students enrolled in electrical and chemical engineering programs.

Engineering Major	Sample Size	Number of Women	Sample Proportion
Electrical Engineering	250	81	
Chemical Engineering	175	40	

Construct a **90% confidence interval** for the difference in the proportion of women enrolled in electrical engineering versus chemical engineering.

- (a) What are we estimating? (Define the parameters of interest.)
- (b) Verify that the necessary conditions for a confidence interval for the difference in two population proportions are met.
- (c) Compute the 90% confidence interval for the parameter defined in Part (a).
- (d) Interpret the confidence interval you found in Part (d).
- (e) Based on the interval, can we infer that one type of engineering has a higher proportion of women enrolled?

2. Suppose you wish to investigate whether the proportion of Clemson undergraduates who drink coffee regularly is lower than the proportion of Clemson graduate students who drink coffee regularly. You gather the following data from randomly selected undergraduate and graduate students at Clemson University.

Student Type	Sample Size	Drink Coffee	Sample Proportion
Undergraduate	320	206	
Graduate	350	238	

Conduct a **hypothesis test** for the difference in the two proportions at the  $\alpha = 0.05$  level.

- (a) Define the parameters of interest in context and state your hypotheses.

- (b) Check the appropriate conditions required for a valid hypothesis test.

- (c) Compute the test statistic.

- (d) Find the associated p-value for the hypothesis test.

- (e) State your conclusion in context of the problem.