

**A.P. Statistics**  
**Assignment 9.1**

**Remember to show your thinking through your work.**

- 1) What conditions must be met before constructing a confidence interval for a proportion? Be sure to be specific with regard to whether you use  $p$  or  $\hat{p}$  in your check.

- 2) What is the formula for the confidence interval. Then, define what each variable represents.

- 3) The Gallup Poll asked a sample of 1785 U.S. adults, "Did you, yourself, happen to attend church or synagogue in the last 7 days?" Of the respondents, 750 said "Yes." Suppose that Gallup's sample was an SRS.

- (a) Give a 99% confidence interval for the proportion of all U.S. adults who attended church or synagogue during the week preceding the poll.

- (b) Do the results provide good evidence that less than half of the population attended church or synagogue?

- 4) A software company is planning for an upgrade of their software. You must charge customers \$100. Are your customers willing to pay this much? You contact a random sample of 40 customers and find that 11 would pay \$100 for the upgrade. Find a 95% confidence interval for the proportion of all of your customers (the population) who would be willing to buy the upgrade for \$100.

- 5) A poll of 811 adults aged 18 or older asked about purchases that they intended to make for the upcoming holiday season. One of the questions asked about what kind of gift they intended to buy for the person on whom they will spend the most. Clothing was the first choice of 487 people. Give a 99% confidence interval for the proportion of people in this population who intend to buy clothing as their first choice.

- 6) When trying to hire managers and executives, companies sometimes verify the academic credentials described by the applicants. One company that performs these checks summarized its findings for a six-month period. Of the 84 applicants whose credentials were checked, 15 lied about having a degree.

- (a) Find the proportion of applicants who lied about having a degree and the standard error.

- (b) Consider these data to be a random sample of credentials from a large collection of similar applicants. Give a 95% confidence interval for the true proportion of applicants who lie about having a degree.

- 7) A question in a Christmas tree market survey was "Did you have a Christmas tree last year?" Of the 500 respondents, 421 answered "Yes."

- (a) Find the sample proportion and its standard error.

- (b) Give a 90% confidence interval for the proportion of Indiana households who had a Christmas tree this year.

- 8) A Gallup Poll used telephone interviews to survey a sample of 1025 U.S. residents over the age of 18 regarding their use of credit cards. The poll reported that 76% of Americans said that they had at least one credit card. Give the 95% margin of error for this estimate.