

# HT for single proportion

Practice problems

10/28/24

1. A recent poll found that 11% of US adults say they have smoked cigarettes in the past week, a historical low. In a random sample of 730 randomly selected students at four-year colleges, it was found that 66 students have smoked cigarettes in the past week. Test that claim that the smoking rate of students at four-year colleges is the same the national US adult average at the 0.05 significance level.
2. An apple farmer has historically lost an average of 4% of his trees each year. He believes that he has been losing more trees lately.
  - a. In a sample of 300 trees, 20 have died. Test the farmer's claim at the 0.01 level.
  - b. How would the situation change if the farmer's sample size had been 200 instead of 300?
3. (\*) A survey was conducted on 850 randomly sampled student loan borrowers, asking them if they owed more than \$30,000 in student debt. A 95% confidence interval for the true proportion of student loan borrowers with at \$30,000 of debt was found to be (0.135, 0.185).
  - a. Based on this information, out of the 850 respondents, how many answered "yes" to the question? Justify your answer.
  - b. Use hypothesis testing to examine the claim that fewer than 18.2% of all student loan borrowers owe at least \$30,000 at the 0.05 significance level.