

MA117 - WORKSHEET 7  
HYPOTHESIS TESTING FOR PROPORTIONS  
Week 2, Wednesday

For each of the following, choose a different significance level. Then answer the question using both (a) a confidence interval and (b) a  $p$ -value hypothesis test.

**Problem 1.** A Rasmussen Reports survey of 1,000 US adults found that 42% believe that raising the minimum wage will help the economy. Do half of US adults believe that raising the minimum wage will help the economy?

**Problem 2.** 400 students were randomly sampled from a large university, and 289 said they did not get enough sleep. Does this represent a statistically significant difference from 50%?

**Problem 3.** It is believed that nearsightedness affects about 8% of all children. In a random sample of 194 children, 21 were found to be nearsighted. Does this data provide evidence that the 8% value is inaccurate?

**Problem 4.** A study examined the average pay for men and women entering the workforce as doctors for 21 different positions. If each gender was equally paid, then we would expect about half of those positions to have men paid more than women, and women would be paid more than men in the other half of positions. The study found that, men were, on average, paid more in 19 of those 21 positions. Does this data provide evidence of a gender pay gap in medicine?

**Problem 5.** As we saw yesterday, the `csv` file at the URL below contains data about a simple random sample of 1000 crimes that occurred in the city of Atlanta between 2009 and 2017. Each row contains information about a single crime from this simple random sample. There are three columns: `crime` classifies the crime into one of several possible types, `date` indicates the date the crime occurred, and `neighborhood` indicates the neighborhood in which the crime occurred.

[https://sagrawalx.github.io/teaching/fa21-b1\\_ma117/class/atlantacrimes.csv](https://sagrawalx.github.io/teaching/fa21-b1_ma117/class/atlantacrimes.csv)

Suppose a national study indicates that 10% of crimes committed in the United States between 2009 and 2017 were classified as `AUTO THEFT`. Does the above data provide evidence that the proportion of crimes committed in Atlanta that are classified as `AUTO THEFT` is different from the national proportion of such crimes?