

# Practice Problems For Hypothesis

Vinny Paris

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1. A teacher in a middle school is interested to see if a new method of teaching reading would improve the literacy rate of their students. So for one year they taught with the new method and then looked at the standardized test scores for their students. From past standardized testing, the teacher believed that the average score would be 82. Please state the Null Hypothesis and Alternative Hypothesis.
2. A light bulb company is trying out a new type of halogen light bulbs which they can produce much cheaper than the old light bulbs. They want their new light bulbs will last less than the old light bulbs. If the new light bulbs don't last as long people will not buy them. So the company runs an experiment with 50 of the new light bulbs running and recorded after how many hours did they fail. It was known through a prior experiment that the old light bulbs would fail on average after 4000 hours of operation. Please state the Null Hypothesis and Alternative Hypothesis.
3. An interesting(-ish) project I was once a part of dealt, in part, with the time it takes someone in a self-driving car to go from not driving to hands on the wheel after the car says to take over. The current theory is that if the display center is too dim driver's will be delayed noticing and in their reaction times. Current delay times is .4 seconds under the older, dim display with the hope the newer display will be able to reduce that time.
4. There is a professor at the University of Maine<sup>1</sup> who is infamous for having his classes run over time. In a given semester an average professor would run over time by an average of 15 seconds. Students

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<sup>1</sup>Go Black Bears!!!

in his class, after being taught hypothesis testing, recorded the time he ran over and then preformed a hypothesis test. Please state the Null Hypothesis and Alternative Hypothesis.

5. I happen to drink a lot of tea. About 9 cups in a day actually and usually some coffee to top it off<sup>2</sup>. I get a lot of my tea down in the East Village of Des Moines at Gung Fu Tea. Because of the amount of tea I buy from them I was once concerned they were underfilling the packages of tea. So over the course of a year I recorded the amount of tea in each package I bought (40 bags in total, each of 2oz) on my own scales at home. After the year was over I found the average package was 2.05 oz. Please state the Null Hypothesis and Alternative Hypothesis.
6. A business owner is interested to see if the a new manufacturer of sweatshirts is producing the sweatshirts at a better quality than the old manufacturer. To this end, the owner has a load of sweatshirts inspected to find the number of mistakes/defected sweaters. The old manufacturer had a defective mean rate of .05. Please state the Null Hypothesis and Alternative Hypothesis.
7. A researcher at a large East Coast university is interested to see if the “science” programs have the same same gps as the “engineering” program. The current gpa in the engineering program is 2.95. Please state the Null Hypothesis and Alternative Hypothesis.

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<sup>2</sup>Grad students survive on caffeine