

Statistics and Data Analysis, Fall 2015
Pre-lecture Problems for Lecture 9: Hypothesis Testing (1)

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Note. DO NOT submit your answers. These problems are only for you to practice by yourselves. Doing these problems definitely help you understand course materials more. Of course, you are more than welcome to discuss these problems with the instructor or TA.

1. Consider the hypothesis introduced on page 14 of the slides.
 - (a) Convince yourself that, if the null hypothesis is true, the sample mean $\bar{X} \sim \text{ND}(1000, 20)$.
 - (b) For $\bar{X} \sim \text{ND}(1000, 20)$, show that $\Pr(\bar{X} \leq 960.8) = 0.025$.
Hint. `NORMDIST()`.
 - (c) Find d such that $\Pr(\bar{X} \leq d) = 0.005$. What does this value of d mean?
Hint. `NORMINV()`.
 - (d) Let $\bar{x}_2 = 952$, find its p -value.
2. I did not do well in the midterm exam and only got 30 points. When considering whether to drop this course, I am wondering how my classmates did. Dropping a course is not an easy decision, and I decide to do that if (and only if) the class average is above 70. Let μ be the class average, which is unknown to me. Write down the statistical hypothesis for me to test the class average.