

**MATH 153 Labs 3: Probability  
Winter 2011**

**Due in class or electronically no later than 11:59pm on 1/20/2011**

**Students will complete all calculations by hand showing work.**

**Students will use either Excel or Minitab to verify calculations.**

**Worth 15% of your overall semester grade**

**Work independently as no two students should have the same data set**

Scenario

In an article in the Journal of Statistics Education (vol.4, no.2, 1996), Allen Shoemaker describes a study that was reported in the Journal of the American Medical Association about the body temperature of adult humans. It is generally accepted that the mean body temperature of adult humans is 98.6 degrees Fahrenheit. In his article, Shoemaker uses data from the article to test his hypothesis.

Here is a summary of his test.

**Claim:** The body temperature of adult humans is 98.6 degrees Fahrenheit

$$H_0: \bar{x} = 98.6 \qquad H_a: \bar{x} \neq 98.6$$

**Sample Size:** n=130

**Population:** Adult human temperatures in Fahrenheit

**Distribution:** Approximately normal

**Test Statistics:**  $\mu = 98.25$ ,  $\sigma = .73$

**Level of Significance:**  $\alpha = .05$

1. Generate a Random Sample of 130 numbers with the numbers in the range between 96.3 and 100.8 with no more than six duplicate numbers.
2. Sketch a sampling distribution of the data.
3. Determine the critical values and add them to your sketch.
4. Determine the rejection regions and shade them in your sketch.
5. Find the standardized test statistic. Add it to your sketch.
6. Make a decision to reject or fail to reject the null hypothesis.
7. Interpret your decision in the context of the original claim.
8. If you lower the level of significance to .01, does that change your decision? Explain.