Math 58B, Spring 2022
Jo Hardin
WU # 18
Thursday, March 31, 2022

Your Name: _____

Names of people you worked with: _____

Instructions: Work on this problem in class with your group. Do your best. This piece of paper will be collected during class.

Task: Many people (particularly those who grew up in countries who use British systems of measurement) consider a "healthy" body temperature to be 98.6 degrees F. Let's say that you took a sample of 130 people and found that their average temperature was 98.249 degrees with a standard deviation of 0.733 degrees. (Both the average and the standard deviation are calculated on the 130 people.)

$$\begin{aligned} n &= 130 \\ \overline{X} &= 98.249 \\ s &= \sqrt{\frac{\sum_{i=1}^{n}(X_i - \overline{X})^2}{n-1}} = 0.733 \end{aligned}$$

Find a T score and a p-value (use `xpt()` in R) to address the null hypothesis that the average healthy body temp is 98.6.

Solution:
$H_0 : \mu = 98.6$
$H_A : \mu \neq 98.6$

$$\text{T score} = \frac{98.249 - 98.6}{0.733/\sqrt{130}} = -5.46$$

`2*mosaic::xpt(-5.46, df = 129)` Gives a p-value of 2.35×10^{-7}.

Conclusion: We definitely reject H_0. There is no way this sample of 130 people came from a population with a true average healthy body temperature of 98.6.