2.5 Problems

1. Suppose you have a test statistic that is standard normally distributed under the null hypothesis $H_0$, and that you compute the test statistic’s value to be $-2.43$ for your data.

   (a) Compute the 2-sided $P$-value of the data.
   (b) Compute the 1-sided to the right $P$-value of the data.
   (c) Compute the 1-sided to the left $P$-value of the data.
   (d) Interpret your result in terms of evidence about the null hypothesis, using the traditional significance level $\alpha = 0.05$. (interpret only the result from (a), not from (b) or (c))

2. Repeat Problem 1, only for a test statistic whose distribution under the null hypothesis $H_0$ is a $t$ distribution with 4 degrees of freedom. Continue to assume that the test statistic’s value is $-2.43$.

3. Suppose you have a test statistic that is standard normally distributed under the null hypothesis $H_0$, and that you compute the test statistic’s value to be $1.98$ for your data.

   (a) Compute the 2-sided $P$-value of the data.
   (b) Compute the 1-sided to the right $P$-value of the data.
   (c) Compute the 1-sided to the left $P$-value of the data.
   (d) Interpret your result in terms of evidence about the null hypothesis, using the traditional significance level $\alpha = 0.05$. (interpret only the result from (a), not from (b) or (c))

4. Repeat Problem 3, only for a test statistic whose distribution under the null hypothesis $H_0$ is a $t$ distribution with 11 degrees of freedom. Continue to assume that the test statistic’s value is $1.98$. 