NAME: _Austin DeCicco_   NET-ID: _ajd295_

1. Consider a Bernoulli population $Ber(p)$. Decide if the following hypothesis is simple or composite and why.

   (a) $p = 0.7$

   Simple

   (b) $p > 0.5$.

   Composite

2. Consider the Bernoulli population again. Suppose the null hypothesis $p = 0.7$ is tested against the alternative $p = 0.9$.

   (a) Suppose that after the experiment, the outcome of the test is that the null hypothesis was rejected. What type of error, type I or type II, are we exposed to?

   Type 1

   (b) Suppose x_1, x_2, x_3 is an observed sample. Intuitively, formulate a test in words. (ie, complete this sentence: I will reject the null hypothesis if _____ .)

   I will reject H_0 if $\bar{X}$, the sample average, is greater than some critical value I choose.

   (c) Continuing previous part. Suppose the test is $\bar{x} > 0.6$. If $1, 0, 1$ is observed, what is the test outcome? Reject

   (d) Compute the probability of committing type I error if the test used is the one in the previous part.

   $$\text{Rejection Space} \begin{cases} 1\,1\,1 \\ 0\,1\,1 \\ 1\,0\,1 \\ 1\,1\,0 \end{cases} \begin{array}{l} (.7)^3 \\ +(.7)(.3) \\ +(.7)^2(.3) \\ +(.7)^2(.3) \\ (.7)^2(.3) \end{array} = .49 \cdot 1.6 \quad \boxed{.784}$$