Name: _____
MAT 222
Spring 2019
Excel Lab 3: Ch. 9

"They mostly come at night. . . mostly."
–Newt, Aliens

Benford's Law (also known as the First-Digit Law or Law of Anomalous Numbers) is an observation that the frequency distribution of leading digits of 'real world' data follows a certain distribution. Specifically, it states that for 'real world' data, the leading digit of numbers follows a distribution given by $\log_{10}(1 + 1/n)$, where n is the leading digit. For example in 'real world' data, the digit '1' occurs as the first digit of a number in a data set with proportion $\log_{10}(1 + 1/1) = \log_{10}(2) \approx 0.301$.

This is often used in finance to detect fraudulent data; that is, if the leading digits of financial data do not follow Benford's Law, one might be suspicious that the data is fabricated, though it does not *prove* that it is fraudulent. In the file `leading_digits.xlsx`, using the calculations for Dataset 1 as a template, perform a χ^2 Goodness of Fit analysis to predict whether each of the datasets is most likely a 'real world' dataset or a faked dataset. [Do not forget to make the prediction for Dataset 1.] Record the X^2 test statistic for each dataset and your predictions below.

Dataset	X^2 Statistic	Real/Fake
1	_____	_____
2	_____	_____
3	_____	_____
4	_____	_____