Nikhil Gopal

**Chapter 2:**

1. Independence obviously does not impact probabilities for a single measurement, but within a dataset, knowing the value of one dependent value can help you predict the value of other values within the datatset.
2. If the researcher knows that the various rulers’ imperfections have been studied adequately, then he can have confidence in his tools and eliminate them as potential sources of variability. Without knowledge that each ruler is the same, the researcher would need to consider the rulers as potential sources of variability. When someone was studying the rulers for imperfections, they would’ve probably thought about similar sources of variability compared to the researcher, as they would need to have confidence in the tools they were using to measure the accuracy of the rulers they were testing.
3. Accuracy refers to how close something is measured to its actual value, while precision refers to consistency in measurement. For example, a 20 pound weight that measures 25, 24 and 24.5 pounds on a scale would be inaccurate, but would be precise because the measurements are consistent. In contrast, a 10,000 pound weight that measured 9,950, 10,050 and 10,005 pounds would be accurate, but not precise.
4. Potential sources of variability for statistical analysis:
   1. Actual mechanism for measurement of data (accuracy/precision of ruler for example)
   2. Human error (recording 1.2111 cm instead of 1.212)
   3. Not everything that receives a treatment is the same (in a clinical trial, some patients might have preexisting conditions for example that affect the viability of a drug)