**MATH221, Week 1**

Classifying Data

Introduction

There are several ways to classify data. Data refer to the list of values. For example, the heights of all the students in this class would be data. It would be possible to also have the favorite color of each of the students in this class and that would be data. The heights would be numeric data and one could find the average height of the class by finding the average of those data. It would not be possible to find the average favorite color of the class. These data are not numbers, but rather are letters. So, one way to classify data is as either numbers or as letters. In statistics, there are several ways to classify data. [As a side note, “data” is plural. The singular form for one value would be “datum”.]

Qualitative/Quantitative

A common way to classify data is as either qualitative or quantitative. Qualitative data are those that cannot be measured on a natural numerical scale. They can only be classified into one of a group of categories, such as colors in the example above. Most often, qualitative data are words or letters. Quantitative data are measurements that are recorded on a naturally occurring numerical scale. Most often, quantitative data are numbers.

Nominal/Ordinal/Interval/Ratio

Another way to classify data is as either nominal, ordinal, interval, or ratio.

Nominal: These data cannot even be put into a logical order. The colors of shirts would be nominal data. While the data could be alphabetized, that is an organizational strategy, rather than a logical requirement.

Ordinal: These data can be put into order, but there is no understandable difference between two data points. The most common example is movie ratings. If someone were to list the movie ratings, there is a logical order: G, PG, PG-13, R. However, it is not possible to subtract two values. For example, PG minus G does not equal P. There is no understandable difference between two data points.

Interval: These data can be put into order, there is an understandable difference between two data point, but there is no true zero. Temperature is the classic example of interval data. These data can be put into order, say from the coldest temperatures to the warmest. It is possible to subtract two temperatures and get an understandable difference, such as today is 10 degrees warmer than yesterday. However, when the temperature outside is 0 degrees, that does not mean that the temperature went away. Zero degrees is an arbitrary point where degrees started to be numbered or counted.

Ratio: This is what is usually thought of as data. These data can be put into order, there is an understandable difference between two data points, and there is a true zero. The scores on a test are ratio data as they can be ordered from smallest to largest, there is a difference such as one student scored 10 points higher than another, and 0 on the test means that someone did not take the test. It is a true zero.