In some data sets, the data is on the same scale, or close, to each other. For example, the largest data value in measles in NYC Diseases is almost 26,000, which happened in March of 1943. The smallest is 11, which occurs in September of 1965. When generating line plots with both these numbers on it, the 11 functionally becomes zero when compared to 26,000, but both are important. To be able to see both these values, we need to be able to plot on a different scale. Our normal plot has all data values with the same weights, but plotting on a logarithmic scale is more conducive to showing the differences at different scales, which frequently makes it easier for us to think about.

As a review, logarithms are the opposite of exponentials. Looking at these values, we now plot the red numbers, not the value provided. And because there is the same amount of space between the y-axis values, we can now see the differences on the smaller numbers, similar to the differences in the larger numbers.

Logs are used in measuring concentrations and change. pH, the concentration of hydrogen ions, acid or base, use the log value. Other common uses are measuring how loud a sound is, commonly called the decibel system, and the Richter scale, used for measuring earthquakes.

The assumption for this class is that we will use base 10 numbers, but others are possible, and very common in nature.

As most plots have 2 axes, and x is the independent axis, you need to ability to plot either x or y, or both on a logarithmic scale. You can do this, but the function commands are different. Just be aware that this capability exists, and details can be found in the MATLAB help function.

Logs are very good for comparing numbers on different scales, and should be a tool you can use.