**Data Normalization, Standardization and Rescaling**

**Normalising** typically means to transform your observations **x** into *f*(**x**) (where *f* is a measurable, typically continuous, function) such that they look normally distributed.

## Properties of a normal distribution:

* The [mean, mode and median](https://www.statisticshowto.datasciencecentral.com/probability-and-statistics/statistics-definitions/mean-median-mode/) are all equal.
* The curve is symmetric at the center (i.e. around the mean, μ).
* Exactly half of the values are to the left of center and exactly half the values are to the right.
* The total area under the curve is 1.

**Scaling** simply means f(x)=cx, c∈R, this is, multiplying your observations by a constant c which changes the scale (for example from nanometers to kilometers). scaling in statistics usually means a linear transformation of the form f(x)=ax+b.

**Standardization:** Normalization is rescaling the values into range of 0 and 1 while standardization is shifting the distribution to have 0 as mean and 1 as a standard deviation.