Answer on Question #43929 – Math – Statistics and Probability

Question:

Discuss the difference between a ratio variable and an interval variable.

Solution:

An **interval variable** is a measurement where the difference between two values is meaningful. The difference between a temperature of 100 degrees and 90 degrees is the same difference as between 90 degrees and 80 degrees. Ratios are not allowed since 20 °C cannot be said to be "twice as hot" as 10 °C, nor can multiplication/division be carried out

A **ratio variable** has all properties of an interval variable, and it also has a clear definition of zero. When the variable equals zero, there is none of that variable. Variables like height, weight, enzyme activity are ratio variables. Having a non-arbitrary zero point makes it meaningful to say, for example, that one object has "twice the length" of another (= is "twice as long"). Very informally, many ratio scales can be described as specifying "how much" of something (i.e. an amount or magnitude) or "how many" (a count).

Temperature, expressed in F or C, is not a ratio variable. A temperature of 0.0 on either of those scales does not mean 'no temperature'. However, temperature in Kelvin is a ratio variable, as 0.0 Kelvin really does mean 'no temperature'.