Frequency

The *frequency* of something is how often it happens.

In data collection, the frequency of an item is the number of times it occurred. The sum of the frequencies of all the items is the total number of data. This could be written as $\sum f_i = n$, where the f_i are the frequencies of the items and n is the total number of items.

In physics, frequency measures how often something occurs in each unit of time. This type of frequency has dimension T^{-1} and SI unit Hz, hertz, where a frequency of $f\,\mathrm{Hz}$ means f times per second.

For data, a closely related idea is *relative frequency*. This gives the frequency of a given item relative to the whole set of data:

$$\text{relative frequency of item} = \frac{\text{frequency of item}}{\text{total number of data items}}.$$

For example, if the data is A, A, B, C, C, D, D, D, with 8 pieces of data in total, then we have:

data value	A	B	C	D
frequency	2	1	2	3
relative frequency	$\frac{2}{8}$	$\frac{1}{8}$	$\frac{2}{8}$	$\frac{3}{8}$

Note that the sum of all of the relative frequencies always equals 1.