THE MEAN

What is the 'Arithmetic Mean'

* The arithmetic mean is a mathematical representation of the typical value of a series of numbers, computed as the sum of all the numbers in the series divided by the count of all numbers in the series.

The most common type of average is the arithmetic mean. If n numbers are given, each number denoted by an i (where i = 1,2, …, n), the arithmetic mean is the sum of the as divided by n or

$$AM = \frac{1}{n} \sum_{i=1}^{n} a_i = \frac{1}{n} (a_1 + a_2 + \cdots + a_n)$$

Harmonic Mean is the reciprocal of the arithmetic mean of the reciprocals. In other words, it is the number of observations, divided by the sum of reciprocals of the observations. This is also is one of several kinds of average and it is appropriate for situations when the average of rates is desired

Harmonic Mean Formula

$$H = \frac{n}{\dfrac{1}{x_1} + \dfrac{1}{x_1} + \ldots + \dfrac{1}{x_1}} = \frac{n}{\sum_{i=1}^{n} \dfrac{1}{x_i}}$$

What is the 'Geometric Mean'

* The geometric mean is the average of a set of products, the calculation of which is commonly used to determine the performance results of an investment or portfolio.

The geometric mean of a data set $\{a_1, a_2, \ldots, a_n\}$ is given by:

$$\left(\prod_{i=1}^{n} a_i \right)^{\frac{1}{n}} = \sqrt[n]{a_1 a_2 \cdots a_n}.$$

The geometric mean is always less than or equal to the arithmetic mean

RMS

* In statistics and its applications, the root mean square (abbreviated RMS or rms) is defined as the square root of mean square (the arithmetic mean of the squares of a set of numbers). The quadratic mean, is a statistical measure of the magnitude of a varying quantity. The RMS is also known as the quadratic mean and is a particular case of the generalized mean with exponent 2. RMS can also be defined for a continuously varying function in terms of an integral of the squares of the instantaneous values during a cycle.

Root mean square or quadratic mean of collection of real numbers X1…..,Xn is defined to be

$$\sqrt{\frac{X1 + X2 + \cdots . + Xn}{n}}$$

This is the second power mean of Xi

It is so named because it is square root mean of the squares of the Xi

It is also part of the well – know RMS – AM – GM – HM inequality