Mean

Definition: The mean of a set of numerical values is the average of the set of values. It is obtained by dividing the sum of data by the number of observations.

$$\overline{x} = \frac{Sum\ of\ Data}{\#\ of\ Observations}$$

We can compute the mean for either population values or sample values.

Rule 1: If the values are from an entire population, then the mean of the values is called a population mean. It is usually denoted by μ (read as "mu").

Population: $\mu = \frac{\sum\limits_{i=1}^{n} x_i}{N}$, N=number of data points

Rule 2: If the values are from a sample, then the mean of the values is called a sample mean. It is denoted by $\overline{x}$ (read as "x-bar").

Sample: $\overline{x} = \frac{\sum\limits_{i=1}^{n} x_i}{n}$, n= number of data points

Example 1: What is the mean of the following sample values?
7 9 11 6 13 6 6 3 11 3

To work out the mean, we apply the formula for sample values:

a) Add up all the numbers **7 + 9 + 11 + 6 + 13 + 6 + 6 + 3 + 11 = 72**

b) Divide the answer by how many numbers there are. There are 9 numbers.
72÷9=8
So the mean value is 8.

Note: sometimes, you do not get a whole number.

Rule 3: **Ungrouped Data:** To calculate the mean of an ungrouped frequency distribution table, we use the formula: $\overline{x} = \frac{\sum\limits_{i=1}^{n} x_i f_i}{n}$

x_i : is the class value

f_i : is the frequency of the class

n : Total frequency

Rule 4: **Grouped Data:** To calculate the mean for a grouped frequency distribution table, we use the formula: $\overline{x} = \frac{\sum\limits_{i=1}^{n} m_i f_i}{n}$

m_i : Midpoint of the interval

f_i : is the frequency of the class

n : Total frequency