

The arithmetical mean is the average value of the samples. It is independent of the width of the intervals. It is symbolized as \bar{x} and it is only used for quantitative variables. We find it by adding up all the value and dividing by the total number of data.

The general formula for N elements is :

$$\bar{x} = \frac{x_1+x_2+x_3+\cdots+x_n}{n}$$

In a basketball match, we have the following points for the players of a team :

0, 2, 4, 5, 8, 8, 10, 15, 38

Calculate the mean of points of the team:

Applying the formula

$$\bar{x} = \frac{0+2+4+5+8+9+10+15+8}{9} = \frac{90}{9} = 10$$

Calculation of the mean for grouped information

The average in the case of N data grouped in n intervals is given by the formula

$$\bar{x} = \frac{x_1 \cdot f_1 + x_2 \cdot f_2 + x_3 \cdot f_3 + \dots + x_n \cdot f_n}{f_1+f_2+f_3+\cdots+f_n}$$

where F_i represent the times that the value x_i is repeated. The grouping can also be done by intervals, using then the intermediate value of the interval to the mean.

The height in cm of the players of a basketball team is in the following table. Calculate the mean.

Interval	x_i	f_i	$x_i \cdot f_i$
[160, 170)	165	1	165
[170, 180)	175	2	350
[180, 190)	185	4	740
[190, 200)	195	3	585
[200, 210)	205	2	410
		12	2250

We calculate the mean for grouped data :

$$\bar{x} = \frac{165.1+175.2+185.4+195.3+202.2}{1+2+4+3+2} = \frac{2250}{12} = 187.5$$

It is also important tp mention that the arithmetical mean is very sensitive to extreme punctuations.