Quartile deviation :

Quartile deviation (Q.D) is an absolute measure of dispersion and it is based upon upper quartile (Q3) and lower quartile (Q1). It represents the average difference between two quartiles and is given by

$$Q.D = \frac{Q3 - Q1}{2}$$

where, Q3 - Q1 is called Inter quartile. So Q.D is called as semi Inter quartile range.

The relative measure of Q.D is called coefficient of Q.D.

$$\text{Coefficient of } Q.D = \frac{Q3 - Q1}{Q3 + Q1}$$

Example : 1

From the following data calculate quartile deviation and its coefficient.

1490 692 777 335 582 488 753 384 407 672 522

Solution : Arrange it in ascending order

335 384 407 488 522 582 672 692 753 777 1490

Q_1 = Size of $\left[\frac{N+1}{4}\right]^{th}$ item

= Size of $\left[\frac{11+1}{4}\right]^{th}$ item

= Size of $\left[\frac{12}{4}\right]^{th}$ item

= Size of $[3]^{th}$ item

$Q_1 = 407$

Q_3 = Size of $3\left[\frac{N+1}{4}\right]^{th}$ item

= Size of $3\left[\frac{11+1}{4}\right]^{th}$ item

= Size of $3\left[\frac{12}{4}\right]^{th}$ item

= Size of $3[3]^{th}$ item

= Size of $[9]^{th}$ item

$Q_3 = 753$

Quartile deviation is,

$$Q.D = \frac{Q_3 - Q_1}{2}$$

$$= \frac{753 - 407}{2}$$

$$= \frac{346}{2} = 173$$

Coefficient of $Q.D = \frac{Q_3 - Q_1}{Q_3 + Q_1} = \frac{753 - 407}{753 + 407}$

$= \frac{346}{1160} = 0.29$

Coefficient of $Q.D = 0.29$

Q_1 = Size of $\left[\frac{N+1}{4}\right]^{th}$ item

= Size of $\left[\frac{11+1}{4}\right]^{th}$ item

= Size of $\left[\frac{12}{4}\right]^{th}$ item

= Size of $[3]^{th}$ item

$Q_1 = 407$

Q_3 = Size of $3\left[\frac{N+1}{4}\right]^{th}$ item

= Size of $3\left[\frac{11+1}{4}\right]^{th}$ item

= Size of $3\left[\frac{12}{4}\right]^{th}$ item

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$Q_3 = 753$

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Coefficient of $Q.D = 0.29$