(2) Discrete Series or Frequency Array and Quartile Deviation.

In a discrete series, quartile deviation is calculated by converting simple frequency of series into cumulative frequency. It is illustrated as below.

Illustration

The following data shows daily wages of 199 workers of a factory find out quartile deviation and the coefficient of quartile deviation.

wage	10	20	30	40	50	60	70	80	90	100
No of wks	2	8	20	35	42	20	28	26	16	2

Soln.

The above series is first converted into a cumulative frequency distribution

wage	Series f	c.f
10	2	2
20	8	10
30	20	30
40	35	65
50	42	107
60	20	127
70	28	155
80	26	181
90	16	197
100	2	199
	N = 100	

Q_1 = Size of $\frac{N+1}{4}$ th item

= Size of $\left(\frac{199+1}{4}\right)$ th item

= Size of 50th item.

50th item lies in 65th cumulative frequency of the series. Wage corresponding to 65th cumulative frequency is ₹40 which therefore is first quartile of the wage distribution. Likewise

Q_3 = Size of $3\left(\frac{N+1}{4}\right)$ th item

= Size of $3\left(\frac{199+1}{4}\right)$ th item

= Size of 150th items.

150th item fall in 155th cumulative frequency of the series wage corresponding to 155 cumulative frequency ₹70 which therefore is the third quartile of the series:

$QD = \frac{Q_3 - Q_1}{2}$

$= \frac{70-40}{2} = \frac{30}{2} = 15$

Coefficient of QD

$= \frac{Q_3 - Q_1}{Q_3 + Q_1} = \frac{70-40}{70+40}$

$= \frac{30}{110} = 0.27$