

Assignment - 2

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Calculated Mean deviation, Variance, Standard deviation & coefficient variation from below data set.

ID	Age	\bar{x}	$x_i - \bar{x}$	$ x_i - \bar{x} $	$(x_i - \bar{x})^2$
17-35338-3	23	$\frac{324}{15}$ $= 21.6$	1.4	1.4	1.96
18-36264-1	22		0.4	0.4	0.16
18-36303-1	21		-0.6	0.6	0.36
19-41242-2	22		0.4	0.4	0.16
20-41959-1	21		-0.6	0.6	0.36
20-42006-1	20		-1.6	1.6	2.56
20-42042-1	21		-0.6	0.6	0.36
20-42079-1	21		-0.6	0.6	0.36
20-42107-1	22		0.4	0.4	0.16
20-42439-1	22		0.4	0.4	0.16
20-42459-1	22		0.4	0.4	0.16
20-42488-1	22		0.4	0.4	0.16
20-42621-1	21		-0.6	0.6	0.36
20-42668-1	22		0.4	0.4	0.16
20-42669-1	22		0.4	0.4	0.16
Total	15			9.2	7.6

$$\text{Mean deviation} = \frac{1}{n} \sum_{i=1}^n |x_i - \bar{x}| = \frac{9.2}{15} = 0.6133$$

$$\text{Variance } \sigma^2 = \frac{1}{n} \sum_{i=1}^n (x_i - \bar{x})^2 = \frac{7.6}{15} = 0.5067$$

$$\text{Standard deviation } \sigma = \sqrt{\text{Variance}} = \sqrt{0.5067} = 0.7118$$

$$\text{Coefficient of variation} = \frac{\sigma}{\bar{x}} \times 100\% = \frac{0.7118}{21.6} \times 100\% = 3.2954\%$$

From the data set,

$$n=15, \quad \sum_{i=1}^n x_i = 324$$

So,

Arithmetic mean:

$$AM = \bar{x} = \frac{1}{n} \sum_{i=1}^n x_i = \frac{324}{15} = 21.60$$

Geometric mean:

$$\begin{aligned} GM = \bar{x}_G &= \left(\prod_{i=1}^n x_i \right)^{\frac{1}{n}} \\ &= (1.031 \times 10^{20})^{\frac{1}{15}} = 21.586 \end{aligned}$$

Harmonic mean:

$$\begin{aligned} HM = \bar{x}_H &= \frac{n}{\sum_{i=1}^n \frac{1}{x_i}} = \frac{15}{0.6953} = \cancel{21.58} \\ &= 21.573 \end{aligned}$$

Median: Ascending order of data

$$A = 20, 21, 21, 21, 21, 21, 22, 22, 22, 22, 22, 22, 23.$$

So median = 22

Mode: Maximum number of value that repeats in the data set, which is 22.