Activity - 5

→ Calculate mean, median, mode, variance, standard deviation, skewness, kurtosis on data set

3, 7, 7, 19, 24, 24, 24, 25, 28, 30.

$$\text{mean} = \frac{3+7+7+19+24+24+24+25+28+30}{10}$$

$$= \frac{191}{10}$$

mean = 19.1

median = 24

$$\text{mode} = \frac{24+24}{2} = 24$$

mode = 24

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

$$= \frac{1}{10}\Big((3-19.1)^2 + (7-19.1)^2 + (7-19.1)^2 + (19-19.1)^2 + (24-19.1)^2 + (24-19.1)^2 + (24-19.1)^2 + (25-19.1)^2 + (28-19.1)^2 + (30-19.1)^2\Big)$$

$$\sigma^2 = \frac{1}{10}(856.9) = 85.69.$$

$\sigma^2 = 85.69$

standard deviation

$$\sigma = \sqrt{85.69}$$

$\sigma = 9.256$

$$\text{skewness} = \frac{n}{(n-1)(n-2)} \sum_{i=1}^{n} \left[\frac{(x_i - \mu)}{s}\right]^3$$

$$= \frac{10}{(10-1)(10-2)} \sum_{i=1}^{10} \left[\frac{(x_i - 19.1)}{9.256}\right]^3$$

skewness = −0.7711

$$\text{kurtosis} = \frac{n(n+1)}{(n-1)(n-2)(n-3)} \sum_{i=1}^{n} \left[\frac{(x_i - \mu)}{s}\right]^4 - \frac{3(n-1)^2}{(n-2)(n-3)}$$

$$= \frac{10(10+1)}{(10-1)(10-2)(10-3)} \sum_{i=1}^{10} \left[\frac{(x_i - 19.1)}{9.256}\right]^4 - \frac{3(10-1)^2}{(10-2)(10-3)}$$

skurtosis = −1.1277