SD - CO4 - 2024-09-18 - Analyze data for summarizing

18 September 2024 13:18

Trimmed Mean:

$\cancel{4}, \cancel{6}, \cancel{8}, \cancel{10}, \cancel{14}, (22, 22, 23, 25, 25,$

$27, 33, 34, 37, 38, 41, 44, 45, 47,$

$48), \cancel{65}, \cancel{87}, \cancel{95}, \cancel{100}, \cancel{110}$

Mean = $\underline{\underline{40.16}}$

It is given by % factor.

20% trimming

$n = 25$

$$\frac{\cancel{20}}{\cancel{100}_{5}} \times 25 = \underline{\underline{5}}$$

After trimming consider the values that are not hidden on both sides. This becomes your new 'n'.

→ Trimmed Mean = $34.06\bar{6}$

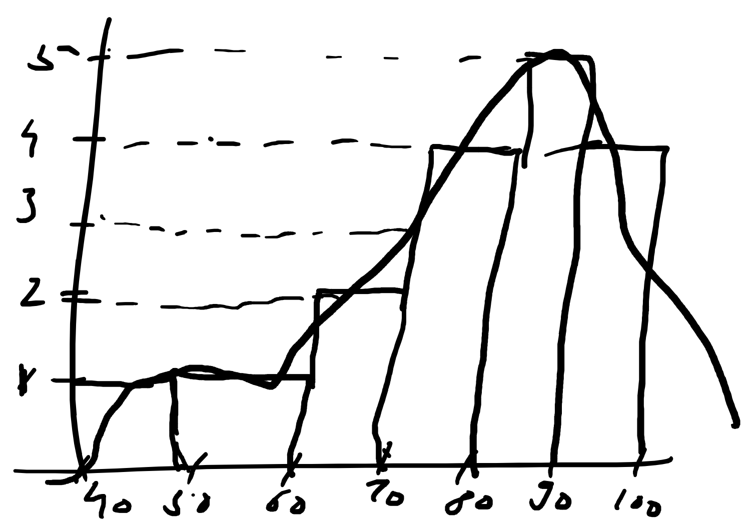
→ If 3 values from each end are trimming, what will be the values after the process.

$$\frac{3}{\cancel{25}_{1}} \times \cancel{100}^{4} = \underline{\underline{12 \text{ percent}}}$$

→ **Histogram:**

Test Scores : 74, 83, 69, 95, 78, 85, 42, 98, 73, 68, 90, 85, 84, 71, 88, 52, 94

Grade	Freq
40 - 49	1
50 - 59	1
60 - 69	2
70 - 79	4
80 - 89	5
90 - 100	4



[illegible]

Right Skewed Dist

→ Continuous Random Variable :

→ Weight of a group of individuals

→ Height — " —

→ Prices

→ Probability Density Function (PDF)

A function $f(x)$ is PDF

if i) $f(x) \geq 0$; $-\infty < x < \infty$

ii) $\int_{-\infty}^{\infty} f(x)\,dx = 1$

Eg: If x is a CRV w/ foll PDF

$$f(x) = \begin{cases} \alpha(2x - x^2) & ; \ 0 < x < 2 \\ 0 & \text{otherwise} \end{cases}$$

find i) α ii) $P(X>1)$

$\rightarrow \int_{-\infty}^{\infty} f(x)\,dx = 1$

$\rightarrow \int_{-\infty}^{0} f(x)\,dx + \int_{0}^{2} f(x)\,dx + \int_{2}^{\infty} f(x)\,dx = 1$

$\rightarrow \int_{0}^{2} \alpha(2x - x^2)\,dx = 1$

$\therefore \alpha\left[x^2 - \frac{x^3}{3}\right]_0^2 = 1$

$\therefore \alpha\left[4 - 8/3\right] = 1$

$\therefore \alpha \; 4/3 = 1 \qquad \therefore \alpha = \frac{3}{4} \approx 0.75$

ii) $P(X>1) = \int_{1}^{2} f(x)\,dx$

$= \int_{1}^{2} \alpha(2x - x^2)\,dx$

$\int^{2} 3/\,(2x - x^2)\,dx$

$$= \int_1^2 \frac{3}{4}(2x - x^2)\,dx$$

$$= \frac{3}{4}\left(x^2 - \frac{x^3}{3}\right)_1^2$$

$$= \frac{3}{4}\left\{(4-1) - \left(\frac{8}{3} - \frac{1}{3}\right)\right\}$$

$$= \frac{3}{4}\left(3 - \frac{7}{3}\right) = \left(\frac{3}{4}\right)\left(\frac{2}{3}\right)$$

$$= \underline{\underline{\frac{1}{2}}} \approx 50\%$$

$$\rightarrow f(x) = \begin{cases} kx^2 & ; -3 < x < 3 \\ 0 & ; \text{otherwise} \end{cases}$$

find k, $P(1 \le x \le 2)$; $P(x \le 2)$, $P(x > 1)$

$$\rightarrow \int_{-3}^{3} kx^2\,dx = 1$$

$$\therefore 2k \int_0^3 x^2\,dx = 1 \qquad \therefore 2k\left(\frac{x^3}{3}\right)_0^3 = 1$$

$$\therefore \quad 2k\left(\frac{27}{3}\right) = 1$$

$$\therefore \quad 18k = 1 \qquad \therefore \quad k = \underline{\underline{1/18}}$$

$$\rightarrow P(1 \le x \le 2) = \int_1^2 f(x)\,dx$$

$$= \frac{1}{18}\int_1^2 x^2\,dx$$

$$= \frac{1}{18}\left(\frac{x^3}{3}\right)_1^2$$

$$= \frac{1}{18}\left(\frac{8}{3} - \frac{1}{3}\right)$$

$$= \frac{1}{18}\left(\frac{7}{3}\right) = \underline{\underline{\frac{7}{54}}}$$

$$\rightarrow P(x \le 2) = \frac{1}{18}\int_{-3}^{+2} x^2\,dx$$

$$= \frac{1}{18}\left(\frac{x^3}{3}\right)_{-3}^{2}$$

$$= \frac{1}{18}\left(\frac{8}{3} - \frac{-27}{3}\right) = \frac{1}{18}\left(\frac{8}{3} + \frac{27}{3}\right)$$

$$= \frac{1}{18}\left(\frac{35}{3}\right) = \underline{\underline{\frac{35}{54}}}$$

$$\to P(X > 1) = \frac{1}{18}\int_1^3 x^2\,dx$$

$$= \frac{1}{18}\left(\frac{x^3}{3}\right)_1^3$$

$$= \frac{1}{18}\left(\frac{27}{3} - \frac{1}{3}\right)$$

$$= \frac{1}{18}\left(\frac{26}{3}\right)$$

$$= \underline{\underline{\frac{26}{54}}} \approx \underline{\underline{13/27}}$$