Name: Raghav Maheshwari
ROLL NO: PA53
Panel: A

Tutorial - 1

Q1 Numbers = 9, 11, 13, 15

$n = 4$

$\Sigma x = 48$

$$V = \frac{1}{n}\Sigma x^2 - \left(\frac{\Sigma x}{n}\right)^2$$

$$= \frac{1}{4}(596) - \left(\frac{48}{4}\right)^2$$

$$= 149 - 144 = 5$$

$$\therefore \sigma = \sqrt{V}$$

$$\sigma = \sqrt{5}$$

Q2 $\Sigma x = 235$, $\Sigma x^2 = 6750$, $n = 10$, $\sigma = ?$

$$V = \frac{1}{n}\Sigma x^2 - \left(\frac{\Sigma x}{n}\right)^2$$

$$= \frac{1}{10}(6750) - \left(\frac{235}{10}\right)^2$$

$$V = 122.75$$

$$\sigma = \sqrt{V} = 11.067 \approx 11.08$$

Q3 $\frac{\text{Standard deviation}}{\text{Arithmetic mean}} \times 100$

$\text{Coeff}(x) = \frac{5.4}{18.0} \times 100 = 30$ $\quad \text{Coeff}(y) = \frac{4.5}{22.5} \times 100 = 20$

$\text{Coeff}(z) = \frac{6.0}{24.0} \times 100 = 25$

$\Rightarrow$ More Stable distribution is y

Q4

	A.M.	S.D.
x	50	24.43
y	46	25.495
z	40	27

$$\text{Coeff.}(x) = \frac{\sigma_x}{\bar{x}} \times 100$$

$$= \frac{24.43}{50} \times 100$$

$$= 48.86$$

$$\text{Coeff.}(y) = \frac{\sigma_y}{\bar{y}} \times 100$$

$$= \frac{25.495}{46} \times 100$$

$$= 55.42$$

PAGE NO. icon
DATE : / /

$$\text{coeff.}(z) = \frac{\sigma_z}{\bar{z}} \times 100$$

$$= \frac{27}{40} \times 100$$

$$= 67.5$$

Since C.V. of x is least so more consistent batsman is x.

Q5 $\bar{x} = 16$

$n = 4$

$$\bar{x} = \frac{\Sigma x}{n}$$

$$\Sigma x = 16 \times 4 = 64$$

$$\Sigma x_{new} = 64 + 4 = 68$$

$$\bar{x}_{new} = \frac{\Sigma x_{new}}{n}$$

$$\bar{x}_{new} = \frac{68}{4} = 17$$

Q6 $\mu_1 = 2$

$\mu_2 = 20$

second moment about mean $= \mu_2 - (\mu_1)^2$

$= 20 - 2^2$

$= 20 - 4 = 16$

Q7 $\mu_1 = 2$

$\mu_2 = 20$

$\mu_3 = 40$

$\mu_4 = 50$

Fourth moment about mean $= \mu_4 - 4\mu_1\mu_3 + 6\mu_2(\mu_1)^2 - 3(\mu_1)^4$

$= 50 - 4(2)(40) + 6(20)(2)^2 - 3(2)^4$

$= 50 - 320 + 480 - 48$

$= 530 - 368$

$= 162$

Q8 Variance

Q3 $n = 5$

$\Sigma x = 1 + 3 + 5 + 7 + 9 = 25$

$\Sigma x^2 = 1^2 + 3^2 + 5^2 + 7^2 + 9^2 = 165$

$$\bar{x} = \frac{\Sigma x}{n}$$

$$= \frac{25}{5}$$

$$\bar{x} = 5$$

$$V = \frac{1}{n}(\Sigma x^2) - \left(\frac{\Sigma x}{n}\right)^2$$

$$= \frac{1}{5}(165) - \left(\frac{25}{5}\right)^2$$

$V = 33 - 25$

$V = 8$

$\sigma = \sqrt{V}$

$\sigma = 2.82$

$$C.V. = \frac{\sigma}{A.M} \times 100$$

$$= \frac{2.82}{5} \times 100$$

$C.V = 56.4 \approx 56.5$