

Assignment-19.3

Calculating Variance of first set.

Total Inputs (N) = (10, 20, 30, 40, 50)

Total inputs (N) = 5.

Mean (\bar{x}_m) = $(x_1 + x_2 + \dots + x_n)/N$.

Mean (\bar{x}_m) = $150/5 = 30$.

$$S.D = \sigma = \sqrt{\frac{(x_1 - \bar{x}_m)^2 + (x_2 - \bar{x}_m)^2 + \dots + (x_n - \bar{x}_m)^2}{(N-1)}}$$

$$= \sqrt{\frac{400 + 100 + 0 + 100 + 400}{4}} = \sqrt{250} = 15.8114.$$

Variance = $SD^2 = (15.8114)^2 \approx 250$.

Calculating variance of second set.

For 5, 10, 15, 20, 25:

Total inputs (N) = (5, 10, 15, 20, 25)

Total no. of inputs = N = 5.

Mean (\bar{x}_m) = $(x_1 + x_2 + x_3 + \dots + x_n)/5 = 75/5 = 15$

$$\text{Variance} = \frac{(x_1 - \bar{x}_m)^2 + (x_2 - \bar{x}_m)^2 + \dots + (x_n - \bar{x}_m)^2}{(5-1)}$$

$$= 62.5$$

To calculate F test

$$F \text{ Test} = \frac{\text{Variance of } (10, 20, 30, 40, 50)}{\text{Variance of } (5, 10, 15, 20, 25)}$$

$$= 250/62.5$$

$$= 4. \text{ The F Test value is 4.}$$