

25) Correlation

- measures strength & direction of linear relationship b/w 2 variables.
- treats both variables equally.
- does not imply causation, only indicates degree to which both var moves together.
- ~~can~~ coefficient ranges from -1 to +1.

Regression

- response to how 1 variable (dependent) changes w.r.t 1 variable (independent).
- differentiates dependent & independent variable.
- ~~can~~ suggest causation, can show how dependant var change w.r.t independent variable.
- provides an equation b/w dependent & independent variable.

26) Price at area (X) = 70
correlation coeff (r) = +0.8

How to do??

27) Two variables x and y

Variance = σ^2 of x = 9

$$\begin{aligned} \text{i) } 8x - 10y &= -66 \quad \times 5 \quad \Rightarrow \quad 40x - 50y = -330 \\ \text{ii) } 40x - 18y &= 214 \end{aligned}$$

① $\therefore \boxed{y = 16.02} \text{ and } \boxed{x = 13.02}$

② for coeff of correlation (r) $\Rightarrow r^2 = \frac{\overline{y}x}{\overline{x}y}$

$$\Rightarrow \boxed{\overline{y}x} = \frac{8}{10} = \boxed{0.8} ; \Rightarrow \boxed{\overline{x}y} = \frac{18}{40} = \boxed{0.45}$$

$$\therefore r^2 = 0.8 \times 0.45 = 0.36 \rightarrow \boxed{r = 0.6}$$

28) Normal distri also known as gaussian distri is defined by its mean (μ) and std dev (σ).

$$PDF \text{ of normal distri} = \frac{1}{\sigma \sqrt{2\pi}} e^{-\frac{1}{2} \left(\frac{x-\mu}{\sigma} \right)^2}$$

- Random sampling \Rightarrow data collected through this
- Independence \Rightarrow observations should be independent of each other.
- Large sample size \Rightarrow sufficiently large to approximate normal distri.
- Continuous data \Rightarrow data should be continuous & measured in interval or ratio scale.

29) Characteristics of normal distri.

- Symmetry \Rightarrow sym about mean. Left and right sides of the curve are mirror images.
- mean, median, mode \Rightarrow all are equal and located at centre.
- Bell shaped curve \Rightarrow most data points cluster around mean, and probabilities taper off as you move away from the mean.
- Asymptotic \Rightarrow tails of the normal distribution approach but never touch horizontal axis. Means there is no zero probability for all values of (x) in real no. line.

30) ~~Correct~~ Correct options are

b, c, d, e.