LECTURE-39

DEGREES OF FREEDOM:

While estimating a mean score (or) a Proportion from a single sample, the number of independent observations is equal to the sample size minus one.

WHY t-SCORE WORKS ON DEGREES OF FREEDOM?

A sample t-test determines whether the difference between the sample mean and the null hypothesis value is statistically significant.

→ this is because, the degrees of freedom are so closely related to sample size, we can see the effect of sample size.

CHI-SQUARE TEST (X^2):

It measures how a model compares to the actual data observed.

→ The x^2 statistic compares the size of any discrepancies between the expected results and the actual results, given the size of the sample and the number of variables in the relationship.

CHI-SQUARE TEST OF INDEPENDENCE:

It is used to determine if there is a significant relationship between the two nominal (categorical) variables.

→ The data can be displayed in a contingency table where each row represents a category for one variable and each column represents a category for the other variable.

KEY TAKEAWAYS:

→ x^2 statistic is measure of the difference between the observed and expected frequencies of the outcomes of a set of events or variables.

→ x^2 depends on the size of the difference between actual and observed values, the degrees of freedom and the sample size.

→ x^2 can be used to test whether two variables are related or independent from one another (or) to test the goodness-of-fit between an observed distribution and a theoretical distribution of frequencies.

FORMULAE:

$$\chi_c^2 = \sum \frac{(O_i - E_i)^2}{E_i}$$

where, c = Degrees of Freedom - [(C-1)(R-1)]

where C = COLUMN
R = ROW

O = Observed value

E = Expected value.

$$E = \frac{\text{Row total} \times \text{column total}}{\text{Grand Total}}$$