Statistics key answer

1. Correlation coefficient

Sometimes two continuous characters are measured in a series or in a similar pattern such as Weight and cholesterol, weight and height, IQ in brothers and sisters. This relationship or association betwee two quantitatively measured or continuously variables is called correlation. The extent or degree of relationship between two sets of figures is measured in terms of anoth parameter called correlation coefficient. It is denoted by r. One can find the relation between weight and cholesterol and cholesterol and CAD.

Correlation determines the relationship between two variables but it does not prove that one particular variable alone causes change in other (-1 Sr=1). Correlation between overcrowding and TB is established, but it does not mean that high rate of TB is due to overcrowding alone.

Types of Correlation Coefficient

1. Perfect positive correlation (r+1)

2. Perfect negative correlation (r-1)

3. Moderately positive correlation 0<r<1

4. Moderately negative correlation -1<r<1

5. Absolutely no correlation r=0

Perfect positive correlation (r+1)

X is directly proportional to Y

Both variables rise and fall in same proportion.

sample, designation and salary, height and weight

Perfect negative correlation (r-1)

Here X and Y are inversely proportional to each other. r=-1

X is inversely proportional to Y

For example, leniency of teacher and discipline among students.

Moderately positive correlation 0<r<1

The correlation between IMR and overcrowding is an example of this.

The plasma value and circulating albumin in grams is another one.

Moderately negative correlation -1 <r< 1

For example, age and vital capacity in adults, IMR, and income.

Absolutely no correlation r=0

For example, habit of smoking and housing facility of person.

2. APPLICATIONS OF THE NORMAL PROBABILITY CURVE

- To normalize a frequency distribution. It is an important step in standardizing a psychological test or inventory To test the significance of observations in experiments.
- Findings them relationships with the chance fluctuations or errors that are result of sampling procedures.
- the standard error of Population from which the samples are drawn by calculating and other statistics.
- To compare two distributions. The NPC is used to compare two distributions. To determine the difficulty values.
- The Z scores are used to determine the difficulty values of test items. To classify the groups. The Normal Probability Curve (NPC) is used for to generalize aboutclassifying the groups and assigning grades to individuals.
- To determine the level of significance.
- The levels of significance of statistics results are determined in terms of NPC limits.
- To scale responses to opinionnaires, judgement, ratings or rankings by transforming them numerical values.

3. Median Test

This test is used to compare the mean of two independent groups. This test is used to test whether independent samples belong to the population having same median or not.

Pre-conditions for Median Test

1. The sample are selected independently and randomly from their respective populations.

2. The populations are of the same form, differ only in location.

3. The variable of interest is continuous.

4. The two samples do not be equal in size.

Procedure of Median Test

1. First collect the two samples.

2. Calculate the combined median.

3. Now two sample observation are tabulated and for this prepare the 2 x 2 contingency table with respect to below median and above median. The 2 x 2 table will be prepared in the following way:will

Sample	Observation	
	Below median	**Above median**
Sample I	a	b
Sample II	c	d

Here, we want to test the null hypothesis, so frame the null hypothesis.

H0: two groups are having the same median.

H0: MA = MB

(Median): (Mediang)

H1 : Two groups are not having the same median. Now, we can test the null hypothesis by the chi-square test, and the formula is:

H:MA is not equal to MB