

Post-hoc Tests

Post-hoc tests (or post-hoc comparison tests) are used at the second stage of the analysis of variance (ANOVA) or multiple Analysis of variance (MANOVA) if the null hypothesis is rejected.

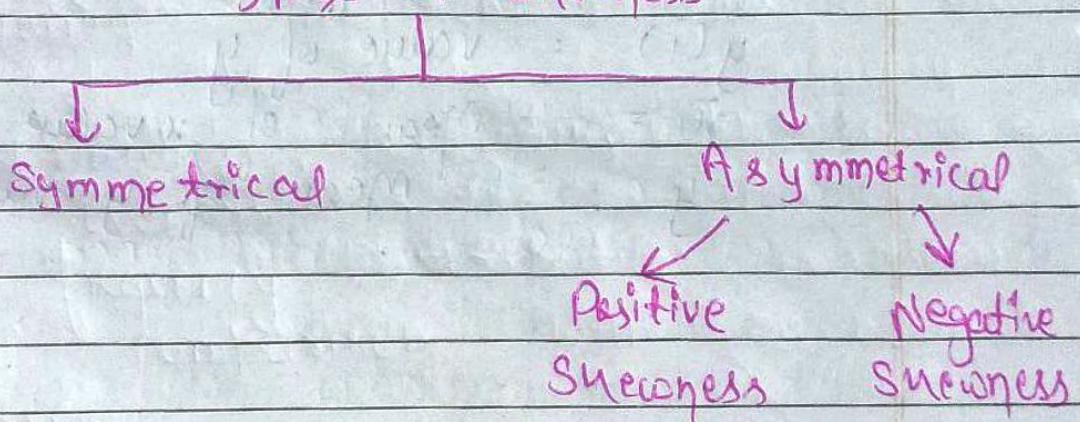
The question of interest at this stage is which groups significantly differ from others in respect to the mean, or in case of MANOVA, in respect to centroids.

The Bonferroni adjustment and the Dunn test are examples of post-hoc testing procedures.

Skewness

Skewness is an important statistical technique that helps to determine a symmetrical behaviour than of the frequency distribution, or more precisely the lack of symmetry of tails both left and right of the frequency curve. A distribution or dataset is symmetric if it looks the same to the left and right of the center point.

Types of Skewness



1. Symmetric Skewness:- A perfect symmetric distribution is one in which frequency distribution is the same on the sides of the center point of the frequency curve.

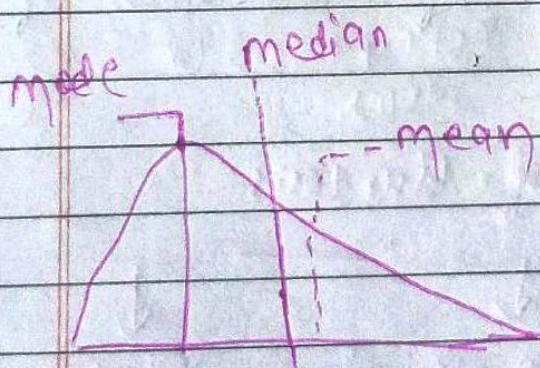
In this, $\text{Mean} = \text{Median} = \text{Mode}$. There is no skewness in a perfectly symmetrical distribution.

2. Asymmetric Shapes:-

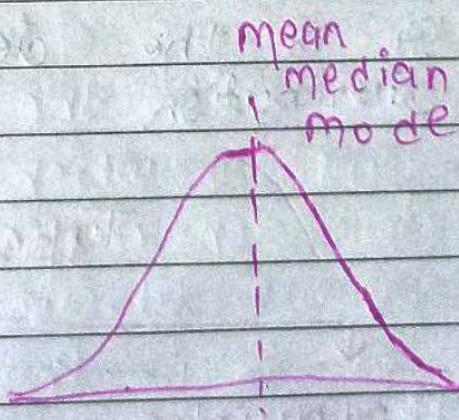
A asymmetrical or skewed distribution is one in which the spread of the frequencies is different on both the sides of the center point or the frequency curve is more stretched towards one side or value of mean. Median and mode falls at different points.

Positive Skewness:- In this, the concentration of frequencies is more towards higher values of the variable i.e., the right tail is longer than the left tail.

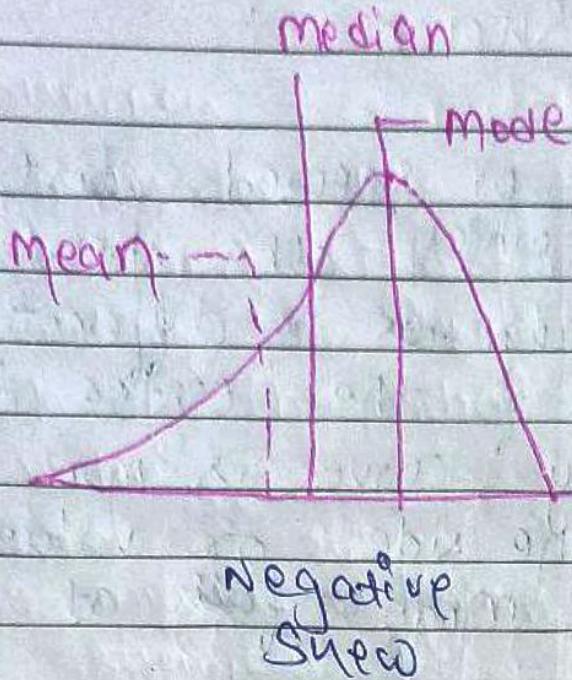
Negative Skewness:- In this, the concentration of frequencies is more towards the lower values of the variable i.e. the left tail is longer than the right tail.



Positive Skew

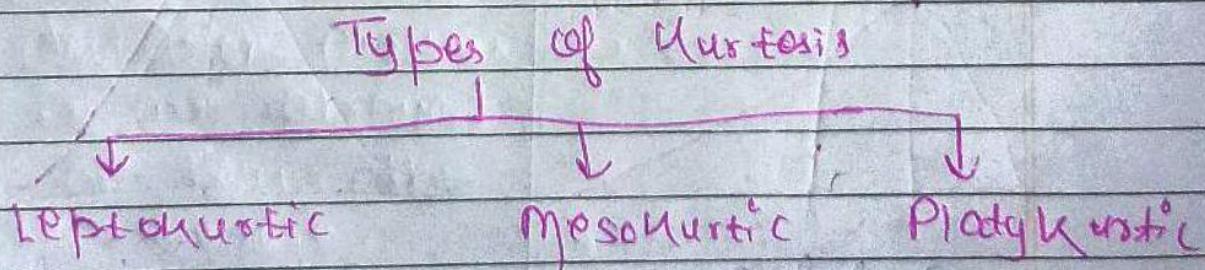


Symmetrical Distribution



Kurtosis

- It is also a characteristic of the frequency distribution. It gives an idea about the shape of a frequency distribution. Basically, the measure of kurtosis is the extent to which a frequency distribution is peaked in comparison with a normal curve.
- It is the degree of peakedness of a distribution.



Lepto Kurtic :-

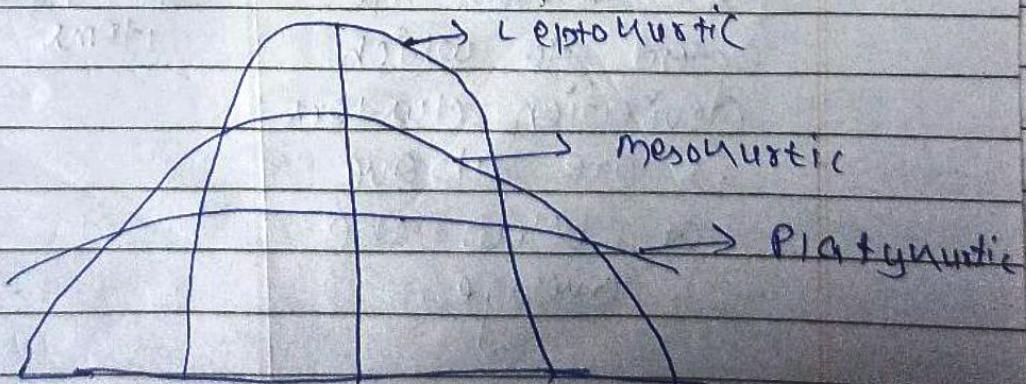
Lepto Kurtic is a curve having a high peak than the normal distribution. In this curve, there is too much concentration of items near central value.

Mesokurtic :-

Mesokurtic is a curve having a normal peak than the normal curve. In this curve, there is equal distribution of items around the central value.

Platy Kurtic :-

Platy Platy Kurtic is a curve having a low peak than the normal curve is called platy kurtic. In this curve, there is less concentration of items around the central value.



SKEWNESS

1. It indicates the shape and size of variation on either side of the central value.

2. The measure difference of skewness tell us about the magnitude and direction of the asymmetry of a distribution.

3. It indicates how far the distribution differs from the normal distribution.

4. The measure of skewness studies the extent to which deviation clusters is are above or below the average.

KURTOSIS

It indicates the frequencies of distribution at the central value.

It indicates the concentration of items at the central part of a distribution.

It studies the divergence of the given distribution from the normal distribution.

It indicates the concentration of items.

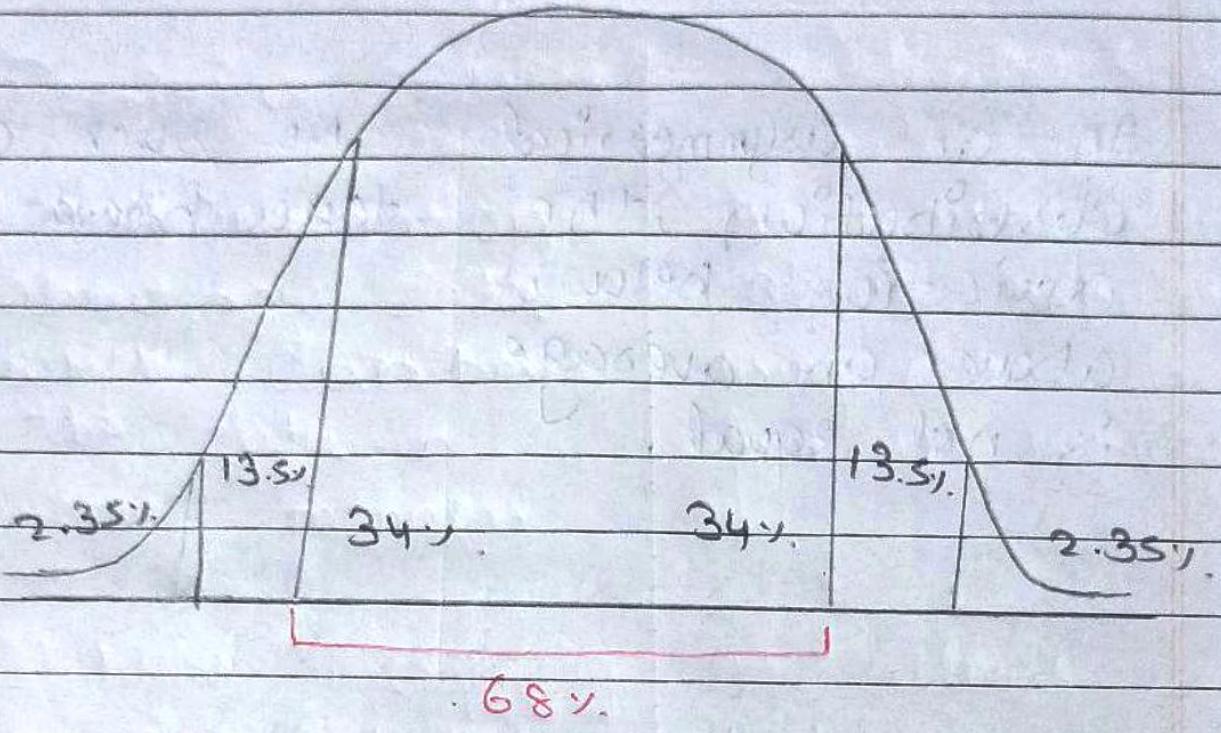
Symmetry

Unstatis

5. In an asymmetrical distribution, the deviation below or above an average is not equal.
- No such distribution takes place.

Empirical Rule:-

- The empirical Rule suggests that 99.7% of data observed following a normal distribution lies within 3 standard deviations from the mean.
- It is also referred to as three-sigma rule or 68-95-99.7 rule.
- In particular, the empirical rule predicts that 68% of observation falls within the first standard deviation ($\mu \pm \sigma$), 95% percent within two standard deviation $(\mu \pm 2\sigma)$, and 99.7% within 3 standard deviations $(\mu \pm 3\sigma)$.



Descriptive Statistics

1. It gives information about raw data which describes the data in some manner.

2. It helps in organizing, analyzing and to present data in a meaningful manner.

3. It is used to describe a situation.

4. It explains already known data and limited to a sample or population having small size.

5. It can be achieved with the help of charts, graphs, tables, etc.

Inferential Statistics

It makes inference about population using data drawn from the population.

It allows us to compare data, make hypothesis and predictions.

It is used to explain the chance of occurrence of an event.

It attempts to reach the conclusion about the population.

It can be achieved by probability.