

G H RAISON COLLEGE OF ENGINEERING AND MANAGEMENT WAGHOLI PUNE



SESSION 2020-21

PRESENTATION ON

STATISTICS

BY

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STATISTICS

- Statistics refers to a branch dealing in the study of collecting, analyzing, interpreting, organizing, and presenting data. In math, it refers to a set of equations that we use to analyze things.
- Statistics is a part of Applied Mathematics that makes use of probability theory to simplify the sample data we collect. It assists in characterizing the probability where the generalizations of data are true. We refer to this as statistical inference.
- We make use of many things in order to represent data. We have bar graphs, pie charts, line graphs, pictographs, histograms, and frequency distribution. Thus, bar graphs are used to represent grouped data by making use of rectangular bars. Then, pie charts are circles which divide into sectors.
- Similarly, line graphs use data points that we call markers. Pictographs make use of pictorial symbols for words or phrases. Further, histograms comprise of rectangles to represent data. Finally, we have frequency distribution where we use a frequency table to arrange the data we collect.

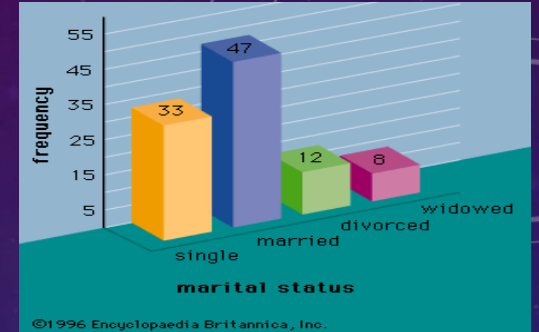
BASICS OF STATISTICS

- The basics of statistics include the measure of central tendency and the measure of dispersion. The central tendencies are mean, median and mode and dispersions comprise variance and standard deviation.
- Mean is the average of the observations. Median is the central value when observations are arranged in an order. The mode determines the most frequent observations in a data set.
- Variation is the measure of spread out of the collection of data. Standard deviation is the measure of the dispersion of data from the mean. The square of standard deviation is equal to the variance.
- Methods
 - The methods involve collecting, summarizing, analyzing, and interpreting variable numerical data. Here some of the methods are provided below.
 - Data collection
 - Data summarization
 - Statistical analysis

REPRESENTATION OF DATA-

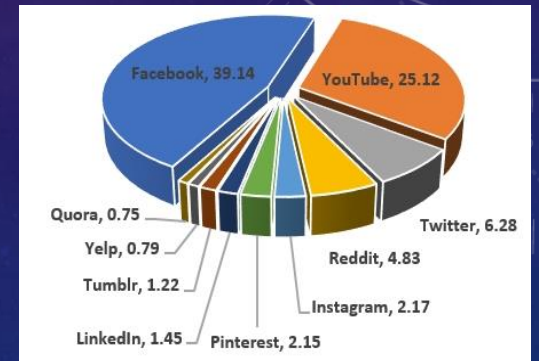
BAR GRAPH

A BAR GRAPH REPRESENTS GROUPED DATA WITH RECTANGULAR BARS WITH LENGTHS PROPORTIONAL TO THE VALUES THAT THEY REPRESENT. THE BARS CAN BE PLOTTED VERTICALLY OR HORIZONTALLY.




PIE CHART

A TYPE OF GRAPH IN WHICH A CIRCLE IS DIVIDED INTO SECTORS. EACH OF THESE SECTORS REPRESENTS A PROPORTION OF THE WHOLE



PICTOGRAPH

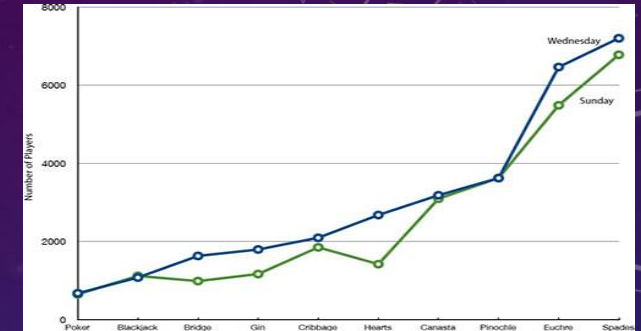
A PICTORIAL SYMBOL FOR A WORD OR PHRASE, I.E. SHOWING DATA WITH THE HELP OF PICTURES. SUCH AS APPLE, BANANA & CHERRY CAN HAVE DIFFERENT NUMBERS, AND IT IS JUST A REPRESENTATION OF DATA.

Variety	Amount of Apples sold (in Kg)
Fuji	12
Kiku	10
Golden delicious	12
Red delicious	16
Ambrosia	10
Key :  Represents 4 Kg	

LINE GRAPH

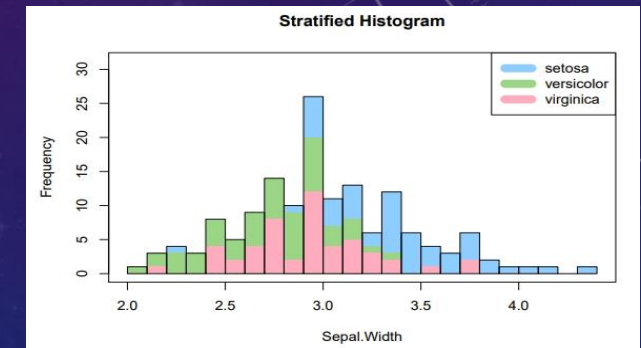
THE LINE CHART IS REPRESENTED BY A SERIES OF DATA POINTS CONNECTED WITH A STRAIGHT LINE.

THE SERIES OF DATA POINTS ARE CALLED 'MARKERS.'



HISTOGRAM

A DIAGRAM IS CONSISTING OF RECTANGLES. WHOSE AREA IS PROPORTIONAL TO THE FREQUENCY OF A VARIABLE AND WHOSE WIDTH IS EQUAL TO THE CLASS INTERVAL.




FREQUENCY DISTRIBUTION

THE FREQUENCY OF A DATA VALUE IS OFTEN REPRESENTED BY "F." A FREQUENCY TABLE IS CONSTRUCTED BY ARRANGING COLLECTED DATA VALUES IN ASCENDING ORDER OF MAGNITUDE WITH THEIR CORRESPONDING FREQUENCIES.

Number of Pets	Frequency
1-2	7
3-4	3
5-6	3
7-8	2



FORMULAS

SAMPLE MEAN

$$\bar{X} = \frac{\sum X}{n}$$


POPULATION MEAN

Population Mean Formula


$$\mu = \frac{\sum x}{N}$$


STANDARD MEAN DERIVATION.

$$s = \sqrt{\frac{\sum (x - \bar{x})^2}{n - 1}}$$

POPULATION MEAN DERIVATION

$$s = \sqrt{\frac{\sum (x - \bar{x})^2}{n - 1}}$$

SAMPLE VARIANCE.

$$s = \sqrt{s^2} = \sqrt{\frac{\sum (x - \bar{x})^2}{N - 1}}$$

POPULATION VARIANCE

Population Variance:

$$\sigma^2 = \frac{\sum (x_i - \bar{x})^2}{N}$$

TYPES OF STATISTICS

- Basically, there are two types of statistics.
- Descriptive Statistics
- Inferential Statistics
- In the case of descriptive statistics, the data or collection of data is described in summary. But in the case of inferential stats, it is used to explain the descriptive one. Both these types have been used in large scale.
- There is one more type of statistics, where descriptive is transitioned into inferential stats.

APPLICATIONS

- Some of the applications of statistic are given below:
- Applied statistics, theoretical statistics and mathematical statistics
- Machine learning and data mining
- Statistics in society
- Statistical computing
- Statistics applied to mathematics or the arts



Thanks you