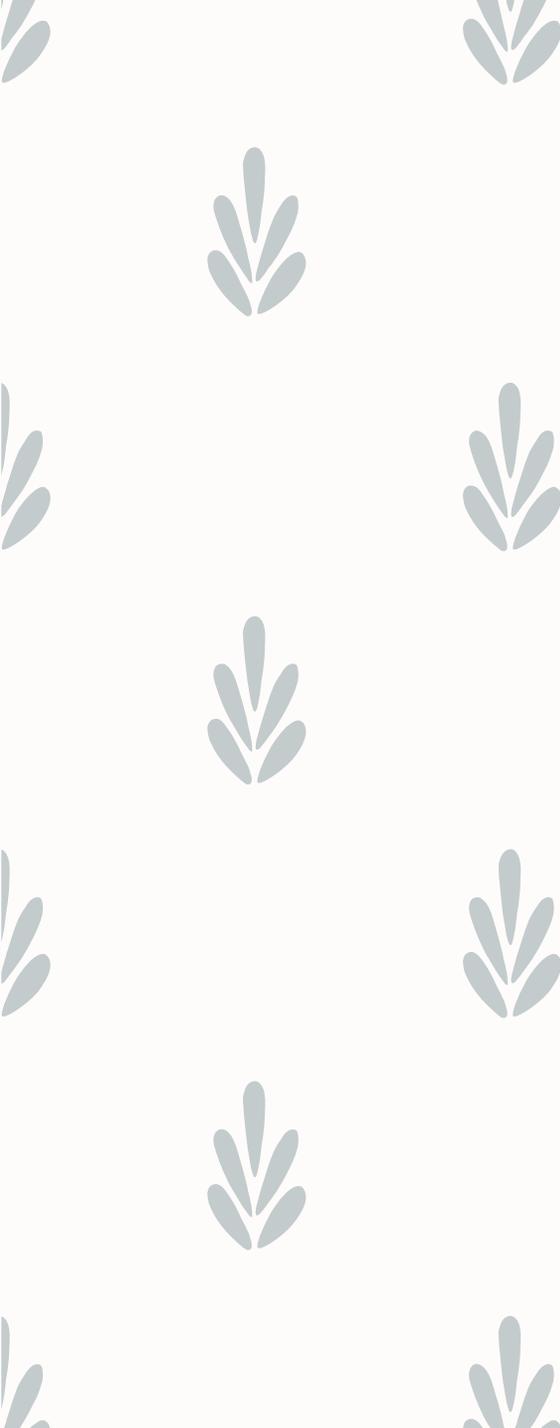




Biostatistics

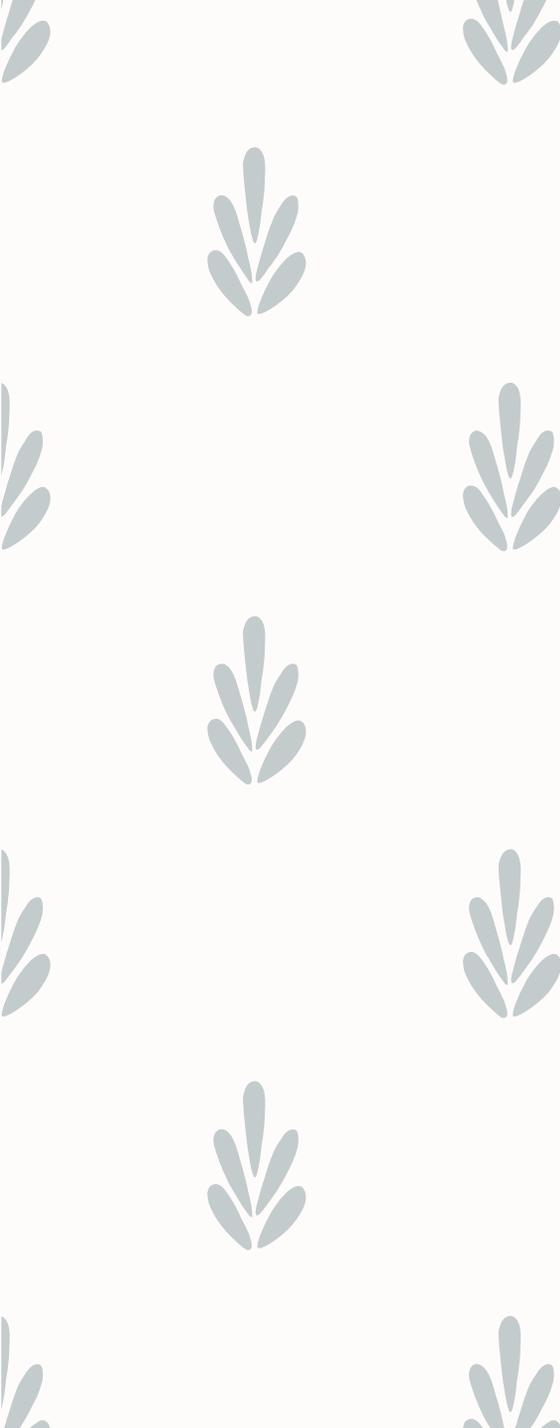
B.Sc. Part II, Paper IV, Group B Biometry

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Introduction to Biostatistics

- Biostatistics is branch of biological science which deals with the study and an methods of collection, presentation, analysis and interpretation of data of biological research. It is also called biometrics as it involves many measurements and calculations. In biostatistics, the statistical methods are applied to solve biological problems. Basic understanding of biostatistics is necessary for study of biology especially research in biological sciences.
- The statistics will help the researchers to
 1. Understand the nature of variability
 2. helps in deriving inferences from samples



History

- Francis Galton is called the “Father of Biostatistics”. He for the first time used the statistical tools to study differences among human populations.
- The term “Biometry was introduced by Walter Weldon.

Common statistical terms

- **Constant:-** Quantities that do not vary. In biostatistics , mean, standard deviation standard error correlation coefficient are considered as constant.
- **Variables:-** A characteristic that takes on different values in different person, place or things.
- **Observations:-** An event and its measurements.
- **Observational units:-** The sources that gives observation for e.g. object, person etc.
- **Population:-** Entire group of people or study elements, person or thing.
- **Sampling Units:-** Each member of a populations.
- **Parameter:-** Constant of a variable, that describe a sample such as mean.
- **Data:-** A set of value on one or more observational units.

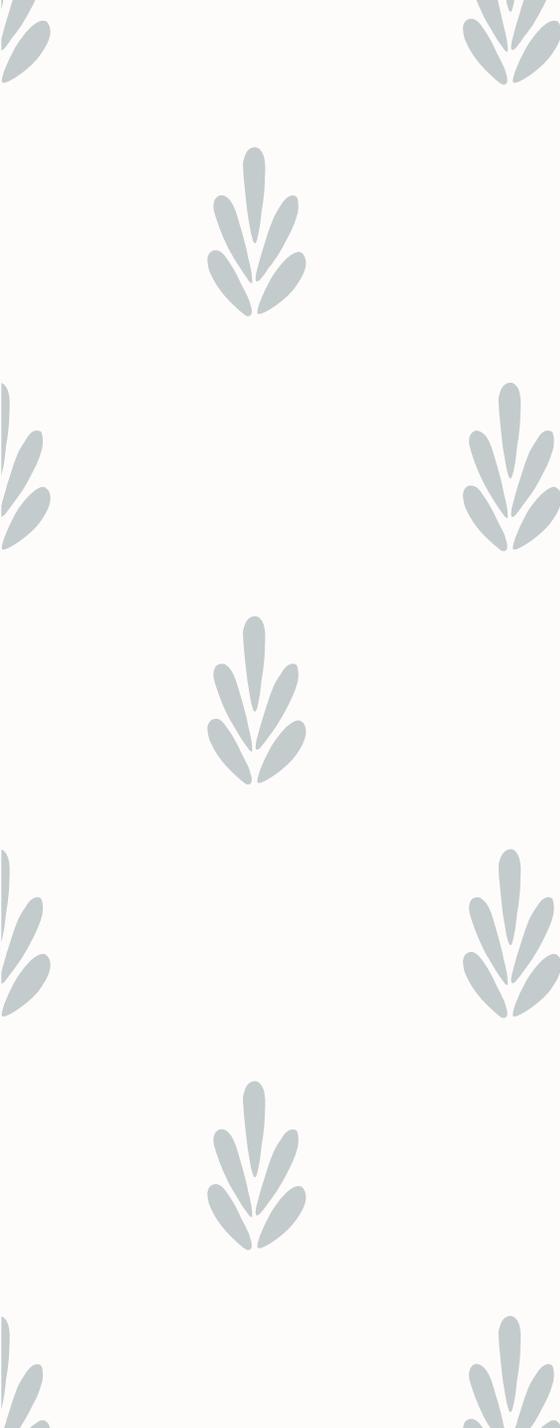
Statistic categories

Statistics is classified into two categories

1. Pure statistics
2. Applied statistics

Pure statistics is the basic statistics . It is sub-divided into 4 categories.

- Descriptive statistics
- Analytical statistics
- Inductive statistics
- Inferential statistics

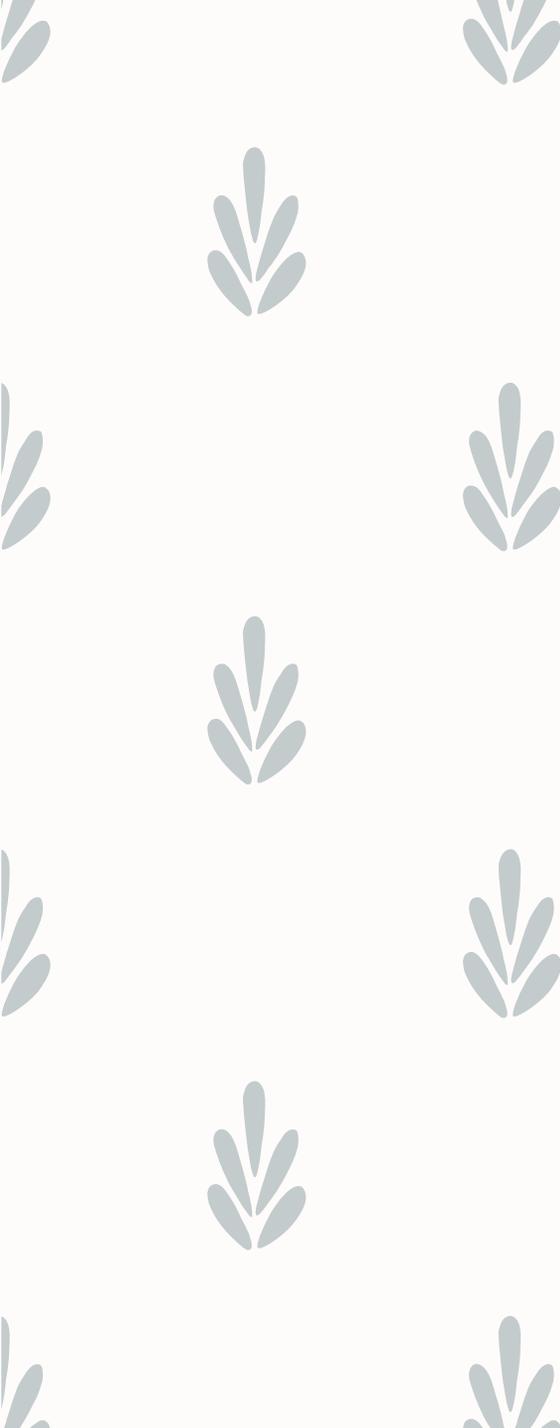


Descriptive statistics:

- These are the statistical tools and analysis which describe and summarise the main feature of the data.
- Ex.- Measure of central tendencies (Mean, Median, Mode) and measures of dispersions (range, standard deviation and mean deviation)
- The descriptive statistics explains the characteristic of the data.
- They reduce the complexity of data into simple and logical summaries.

Analytical statistics:

- Deals with all tools in the statistics used to compare different variables
- Helps to establish functional relationship with variables
- Example. Correlation and regression

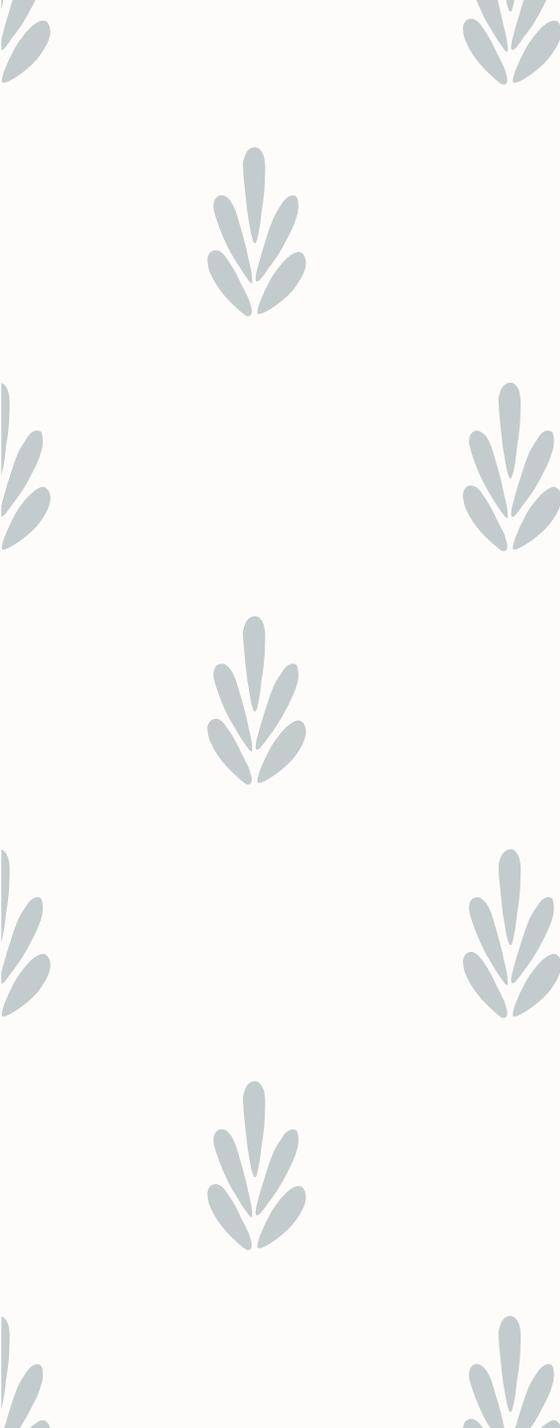


Inductive statistics:

- Applies the use of statistical tools to generate conclusions on the basis of random observations.
- It deals with conclusions, generalizations, predictions and estimations based on data from sample.

Inferential statistics:

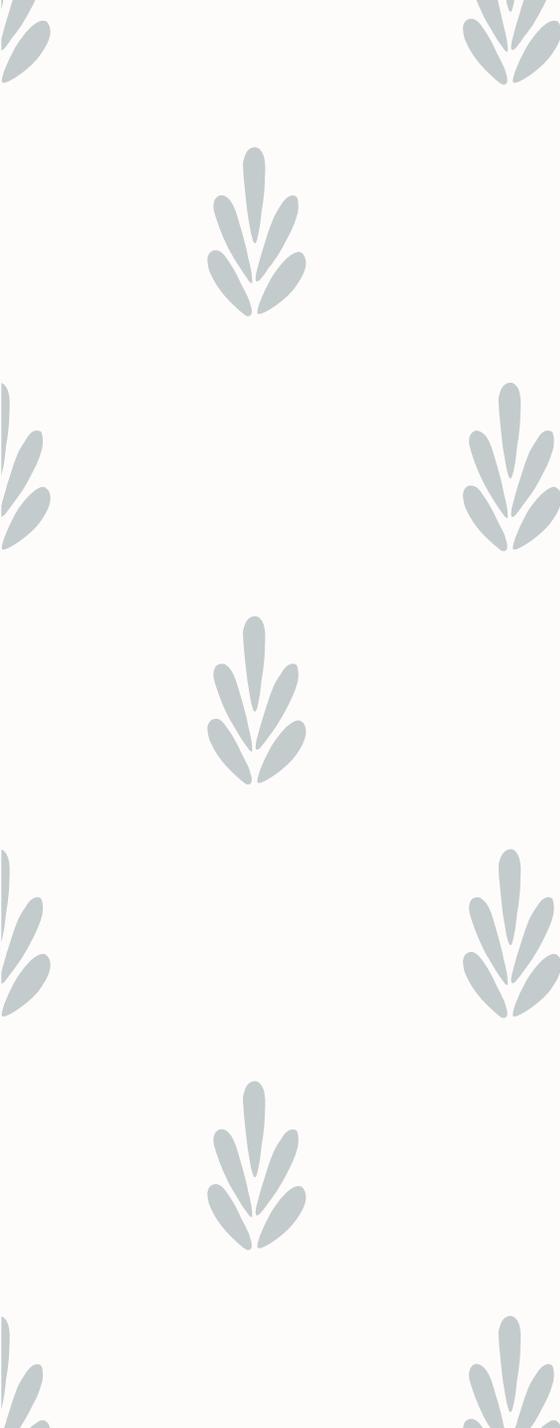
- It applies the statistical theories to analyse the research problems.
- It includes complex calculations, analysis and comparison.
- Ex. Index no., statistical quality control, vital statistics etc



Classification of biostatistics

Conventionally biostatistics is divided into two aspects:

1. The design of experiments for collection of data.
2. The statistical analysis.



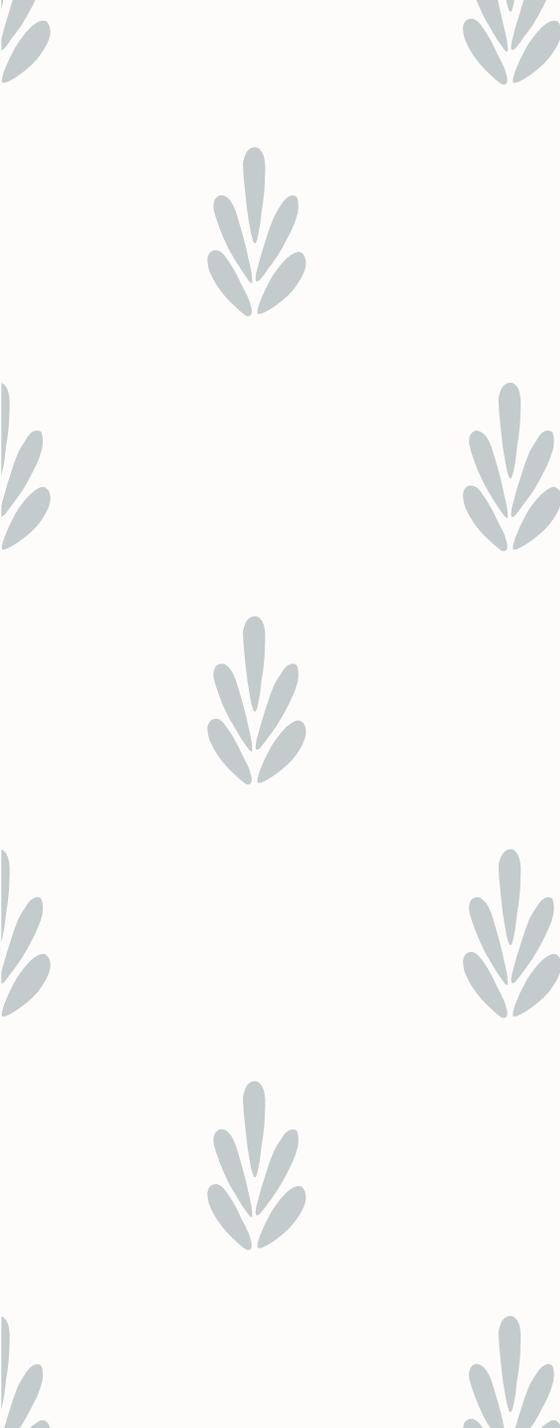
Steps in biostatistics

1. Collection of data
2. Classification of the data
3. Analysis of data
4. Interpretation of data

Significance

Biostatistics has applications in various branches of life sciences-

- Research
- Medical and pharmaceutical sciences
- Genetics
- For monitoring the community and public health
- Demography
- In weather forecasting
- In implementing government policies.



Limitations of statistics

- True on averages. Single observation is not a statistic.
- Cannot be applied to single or individual data.
- Best applicable on quantitative data.
- Cannot be applied to highly heterogenous data.
- The statistical results might be misleading if sufficient care is not taken in collecting , analysing and interpreting the data.
- There are too many methods to study a single problem.
- Errors are possible.