Exploratory Statistical Data Analysis With R Software (ESDAR)

Swayam Prabha

Lecture 8

Basic Concepts of Exploratory Statistical Data

Shalabh

Department of Mathematics and Statistics

Indian Institute of Technology Kanpur

Slides can be downloaded from

http://home.iitk.ac.in/~shalab/sp

Exploratory Statistical Data Analysis

Several components and tools- Graphical, analytical

Graphical tools- various type of plots

- **2D and 3D plots,**
- **scatter diagram**
- **Pie diagram**
- **Histogram**
- **Bar plot**
- **Stem and leaf plot**
- **Box plot etc.**

Use appropriate graphics.

Analytical tools

Central tendency of data	Dispersion in data
• Mean • Median • Mode • Geometric mean • Harmoninc mean • Quantiles etc.	• Variance • Standard deviation • Standard error • Mean deviation, • Absolute deviation • Range etc.

Analytical tools

Structure of data	Relationships in data
• Symmetricity • Skewness • Kurtosis etc.	• Correlation coefficient • Rank correlation • Multiple correlation coefficient • Partial correlation coefficient • Corralation ratio • Intraclass correlation • Linear Regression • Non linear regression etc.

Statistical thinking and Methods

Which of the tools to be used – Graphical or analytical?

Use both types of tools.

Graphical tools provide a visulization – First hand information.

Analytical tools – Quantitative information.

Both approaches work together and are inseperable.

Statistical thinking and Methods

Both – graphical and analytical tools – work together in a system of interconnected processes.

Variation exists in all processes.

Understanding the extent of variation and reducing it are the keys to success.