SNS COLLEGE OF ENGINEERING

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Accredited by NAAC-UGC with 'A' Grade

Approved by AICTE & Affiliated to Anna University, Chennai

DEPARTMENT OF ARTIFICIAL INTELLIGENCE AND DATA SCIENCE

19AD504 – DATA VISUALIZATION

UNIT –I

VISUALIZING COMPARISONS

Visualizing comparisons in data visualization is crucial for effectively communicating differences, similarities, and trends in data.

1. Bar Charts

- **Purpose**: Compare quantities across different categories.
- **How to Use**: Display vertical or horizontal bars to represent data values. Useful for showing differences in size, frequency, or other metrics across categories.
- **Example**: Comparing sales revenue across different months.

2. Column Charts

- **Purpose**: Similar to bar charts but with vertical bars, ideal for time series data or categorical data with a natural order.
- **How to Use**: Use vertical bars to show data values. Useful for tracking changes over time or comparing different groups.
- **Example**: Monthly temperature changes throughout a year.

3. Line Charts

- **Purpose**: Show trends over time or continuous data.
- **How to Use**: Plot data points connected by lines to illustrate trends, patterns, and changes.
- **Example**: Stock price movements over the past year.

4. Pie Charts

- **Purpose**: Show proportions and percentages of a whole.
- **How to Use**: Display slices representing parts of a whole. Best for showing percentage distribution among categories.
- **Example**: Market share distribution among companies.

5. Scatter Plots

- **Purpose**: Display relationships between two variables.
- **How to Use**: Plot individual data points on a Cartesian plane. Useful for identifying correlations and outliers.
- **Example**: Relationship between hours studied and exam scores.

6. Stacked Bar/Column Charts

- **Purpose**: Show part-to-whole relationships and comparisons between categories.
- **How to Use**: Display bars or columns divided into segments that represent different sub-groups or categories within each bar.
- **Example**: Comparing total sales with the breakdown of sales by product category over several months.

7. Heat Maps

- **Purpose**: Visualize data density or intensity using color.
- **How to Use**: Use color gradients to represent data values in a matrix format. Effective for showing variations across a grid.
- **Example**: Website traffic by hour and day of the week.

8. Box Plots

- **Purpose**: Summarize the distribution of data and identify outliers.
- **How to Use**: Display the median, quartiles, and potential outliers within data. Useful for comparing distributions across categories.
- **Example**: Comparing test score distributions between different classrooms.

9. Bubble Charts

- **Purpose**: Show relationships between three variables.

- **How to Use**: Use bubbles with varying sizes and colors to represent data points across two axes and a third dimension (size).
- **Example**: Comparing company revenue, profit, and employee count.

10. Radar Charts

- **Purpose**: Compare multiple variables or attributes.
- **How to Use**: Display data on a circular grid to show performance across several categories.
- **Example**: Comparing features of different smartphone models.

11. Tree Maps

- **Purpose**: Visualize hierarchical data as nested rectangles.
- **How to Use**: Use rectangles of varying sizes and colors to show data hierarchy and proportions.
- **Example**: Visualizing budget allocation across departments.

Tips for Effective Data Visualization

1. **Keep It Simple**: Avoid clutter and focus on the key message.
2. **Choose the Right Chart Type**: Select the chart that best represents your data and comparison goal.
3. **Use Consistent Scales**: Ensure that scales are consistent to avoid misleading interpretations.
4. **Label Clearly**: Include clear labels, legends, and titles to make charts understandable.
5. **Highlight Key Insights**: Use color or annotations to emphasize important data points or trends.