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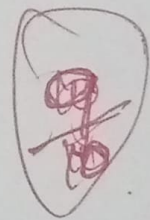
NTU :- 27156

Course Name :- Data Visualization

Course code :- 10212CS214

Slot :- S4L6

Faculty :- Dr. Sathish . N



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Explain how human perceptual processing models and gestalt principles influence the effectiveness of data visualization. Discuss with suitable examples how visualization designers can minimize information clutter using concepts such as Gibson's affordance theory.

1) Human Perceptual Processing in visualization.

→ Human perception is not neural - our brains are wired to spot patterns, contrasts, groups, and relationships quickly.

→ Visualization works best when it leverages these built-in perceptual tendencies.

2) Gestalt principles in visualization.

→ Gestalt psychology explains how people naturally organize visual information.

→ Visualization designers use these principles to guide perception.

→ proximity, similarity, continuity, closure, Figure-ground

3) Minimizing information Overload.

→ When datasets are large or complex, visualization must filter, abstract, and represent data carefully.

(a) Gibson's Affordance Theory.

(b) Data Abstraction

(c) Appropriate dataset Representation.

4) Maximizing Information clarity.

-> visualization designers can achieve clarity by

- Using gestalt grouping to structure related data visually
- Applying minimalism
- Leveraging color

2) With the help of suitable datasets, compare and contrast different visualization techniques used in univariate, Bivariate and multivariate analysis.

1) Univariate Analysis (one variable at a time).

- Focus : Distribution, frequency, and spread of a single variable.

visualization Techniques.

* categorical vs categorical.

- Grouped Bar chart
- stacked Bar chart

* categorical vs. continuous.

- Box plot
- strip plot

* continuous vs continuous:- Scatter plot.

2) Bivariate Analysis (Two variables at a Time).

- Focus : Relation ship , correlation , or comparison between two variables.

visualization Techniques.

- categorical vs categorical
- categorical vs continuous
- continuous vs continuous.

3) Multivariate Analysis (Three or More Variables)

- Focus : Interactions and patterns among multiple variables.

visualization Techniques.

* categorical + continuous + continuous.

* continuous + continuous + continuous.

* Many variables.

