Data types sources

- Data (https://www.geeksforgeeks.org/data-visualization-and-its-importance/)
- Structured vs Unstructured (https://www.geeksforgeeks.org/difference-between-structured-semi-structured-and-unstructured-data/)
- Special type of data 1. Temporal

  2. Geographic

  3. Doc,Img,video,audio,3D

  4. Raw data

- Qualitative(categorical) V/s Quantitative(Numerical)
- Quantitative 1. Discrete 2. Continuous
- 4 levels of data measurement (https://careerfoundry.com/en/blog/data-analytics/data-levels-of measurement/#:~:text=There%20are%20four%20types%20of,adds%20another%20level%20of%20precision.)

  1.Nominal
  2. Ordinal
  3. Interval
  4. Ratio

- NOIR Stanley Stevens
- Data Sources 1. Files

  2. Database

  3. Internet

  4. Open data

- Crawlers or spiders ○ Scraping data from semi-structured sources
  - ■ Parse HTML
  - ■ Match Patterns to extract data
  - ■ Identify links (repeat)
- URL ○ Files and databases on the web ○ Many libraries and apps will accept either a local path or url

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06 Data Visualisation

Communication

Communication : Analyzing and Presenting
Graphic Communication: Sender, medium , message, receiver

Graphic Communication: Stages of Understanding

- Sensing → your brain seeing colours and shapes
- Perceiving → what does it show? big, small, bright, red,
- Interpreting → what does it mean? increasing, smaller, good, bad
- Comprehending → what does it mean **to me**? relevance, consequences

Graphic Communication Goals

- Information
- Persuasion
- Education
- Entertainment

Graphic communication, particularly through **data visualization and management**, aims to present complex information effectively by leveraging these core goals:

1. Information

- **Purpose:** Deliver clear, accurate, and concise data to the audience.
- **Use in Visualization:** Charts, graphs, and dashboards help reveal trends, relationships, and comparisons at a glance.
- **Example:** Real-time sales dashboards for tracking key performance indicators (KPIs).

2. Persuasion

- **Purpose:** Influence decisions or opinions using data-backed arguments.
- **Use in Visualization:** Infographics and comparative visuals emphasize critical points to support a message.
- **Example:** A graph showing environmental benefits of renewable energy over fossil fuels to advocate for policy changes.

3. Education

- **Purpose:** Enhance understanding of concepts or processes through accessible, structured content.
- **Use in Visualization:** Interactive tools, flowcharts, and annotated diagrams simplify learning.
- **Example:** Tutorials using step-by-step flowcharts for process improvement in business.

4. Entertainment

- **Purpose:** Engage audiences with visually appealing and fun representations of data.
- **Use in Visualization:** Creative visuals, animations, or gamified charts make data more relatable.
- **Example:** Interactive maps showing world populations in an engaging, user-driven way.

Data visualization combines these goals to make information intuitive, actionable, and meaningful, driving better management and decision-making.

Data Visualisation: Good Things to Know

- Why visualise data? To explore and analyse ， To communicate

• Good things to know

• Pie charts
Only for parts of a whole (ie, 100% divided into categories) • No more than 5 slices • Label carefully and clockwise, decreasing in size • Minimise user effort and never 3D effect
• 3D
• Area
• Axes
• Clutter
• Good Visualisation?

Data visualization II

Chart types (https://www.atlassian.com/data/charts/essential-chart-types-for-data-visualization)
Categorical: comparing categories and distributions of quantitative values

Hierarchical: Charting part-to-whole relationships and hierarchies

Relational: Graphing relationships to explore correlations and connections

Temporal: Showing trends and activities over time

Spatial: Mapping spatial patterns through overlays and distortions