Here's a guide to help you understand **when to use charts, graphs, or maps** for data visualization, along with tricks to guess the correct choice based on a given statement.

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1. Charts

- **Best For:**
  Showing comparisons, proportions, or distributions within categories.

- **Examples of Charts and When to Use Them:**

  1. **Bar Chart:**

     - Compare data across categories (e.g., sales by region).

     - *Trick:* Look for words like **compare** or **categories**.

  2. **Pie Chart:**

     - Show proportions of a whole (e.g., percentage of market share).

     - *Trick:* Look for words like **percentage**, **parts of a whole**, or **distribution**.

  3. **Stacked Bar Chart:**

     - Compare proportions within categories (e.g., gender distribution across departments).

     - *Trick:* Look for multiple parts making up a total.

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2. Graphs

- **Best For:**
  Showing trends, relationships, or changes over time.

- **Examples of Graphs and When to Use Them:**

  1. **Line Graph:**

     - Show trends or changes over time (e.g., temperature over a week).

     - *Trick:* Look for time-related keywords like **over time**, **trend**, or **progression**.

  2. **Scatter Plot:**

     - Show relationships between two variables (e.g., study hours vs. exam scores).

     - *Trick:* Look for phrases like **relationship**, **correlation**, or **two variables**.

  3. **Histogram:**

     - Show frequency distribution (e.g., number of students scoring within certain grade ranges).

     - *Trick:* Look for words like **frequency**, **distribution**, or **range of values**.

3. Maps

- **Best For:**
  Geographical or spatial data.

- **Examples of Maps and When to Use Them:**

    1. **Choropleth Map:**

        - Show data intensity by region (e.g., population density).

        - *Trick:* Look for **location-based comparisons** like **regions**, **countries**, or **areas**.

    2. **Heat Map:**

        - Show intensity or frequency in a spatial area (e.g., traffic congestion in a city).

        - *Trick:* Look for **patterns in a location** or **hotspots**.

    3. **Point Map:**

        - Pinpoint locations of events (e.g., COVID-19 cases across a country).

        - *Trick:* Look for data about **specific locations or events**.

Tricks to Guess from a Statement

1. **Look for keywords in the problem:**

    - **Time-based data:** Use a **line graph**.

    - **Location or geography:** Use a **map**.

    - **Comparison across categories:** Use a **bar chart**.

    - **Proportion or percentage:** Use a **pie chart**.

    - **Relationships between variables:** Use a **scatter plot**.

    - **Frequency of ranges:** Use a **histogram**.

2. **Identify the type of data:**

    - If it's **quantitative data** changing over time → **Graph (line graph)**.

    - If it's **categorical data** → **Chart (bar or pie chart)**.

    - If it involves a **place** or **region** → **Map**.

3. **Visualize the question:**

    - Ask yourself:

        - **What's being compared?** (Use a chart.)

        - **Is it changing over time?** (Use a graph.)

- **Is it tied to a location?** (Use a map.)

Examples for Practice

1. **Question Statement:**
   "Show how Ireland's COVID-19 cases evolved over 2020."

   - **Answer:** Line graph → It's time-based.

2. **Question Statement:**
   "Compare sales across five product categories in Q1."

   - **Answer:** Bar chart → It compares categories.

3. **Question Statement:**
   "Highlight population density in different counties of Ireland."

   - **Answer:** Choropleth map → It's about geographical regions.

4. **Question Statement:**
   "Show the correlation between hours studied and exam scores."

   - **Answer:** Scatter plot → It's about relationships between two variables.

Quick Summary

Data Focus	Use This Visualization	Key Words
Time-based trends	Line graph	Over time, trends, progression
Comparison of categories	Bar chart	Compare, categories
Proportions of a whole	Pie chart	Percentage, proportion
Geographical data	Map	Region, location, geography
Relationship between two	Scatter plot	Correlation, relationship

Good luck on your exam! 😊

Here's a guide to help you quickly understand when to identify **qualitative**, **quantitative**, **nominal**, **ordinal**, **continuous**, **discrete**, **interval**, and **ratio** data, along with tricks to guess based on a statement.

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1. Qualitative vs. Quantitative

Qualitative Data

- **Definition:** Data that describes **qualities, categories, or labels**. No numerical meaning.

- **Examples:**

  - Colors of cars (red, blue, green).

  - Modes of transport (bus, train, bike).

  - Names of students.

- **Trick to Guess:** Look for **descriptions or labels** with no numerical value.

  - *Question clue:* "What is your favorite ice cream flavor?" → **Qualitative.**

Quantitative Data

- **Definition:** Data that represents **numbers or measurements** and has mathematical meaning.

- **Examples:**

  - Age (30 years).

  - Height (5.8 feet).

  - Test scores (85%).

- **Trick to Guess:** Look for **numerical data** that you can count or measure.

  - *Question clue:* "How many books do you own?" → **Quantitative.**

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2. Nominal vs. Ordinal

Nominal Data (Qualitative)

- **Definition:** Categories with **no meaningful order**.

- **Examples:**

  - Types of fruit (apple, orange, banana).

  - Gender (male, female).

  - Eye color (brown, blue, green).

- **Trick to Guess:** Look for **unordered categories**.

  - *Question clue:* "What is your blood type?" → **Nominal.**

Ordinal Data (Qualitative)

- **Definition:** Categories with a **meaningful order**, but the difference between values isn't measurable.

- **Examples:**

  - Clothing sizes (Small, Medium, Large).

  - Educational levels (High School, Bachelor's, Master's).

  - Satisfaction ratings (Very satisfied, Satisfied, Neutral).

- **Trick to Guess:** Look for **ranked or ordered categories**.

  - *Question clue:* "Rate your experience from 1 to 5." → **Ordinal.**

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3. Continuous vs. Discrete (Both Quantitative)

Continuous Data

- **Definition:** Data that can take **any value within a range**, including fractions/decimals.

- **Examples:**

  - Height (5.6 feet).

  - Weight (70.5 kg).

  - Temperature (36.6°C).

- **Trick to Guess:** Look for **measurements** with possible decimals.

  - *Question clue:* "How much time does it take to commute to work?" → **Continuous.**

Discrete Data

- **Definition:** Data that can only take **specific values (countable numbers)**.

- **Examples:**

  - Number of children (0, 1, 2, 3).

  - Number of cars owned (1, 2).

  - Number of students in a class.

- **Trick to Guess:** Look for **countable items** (whole numbers only).

  - *Question clue:* "How many pets do you have?" → **Discrete.**

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4. Interval vs. Ratio (Both Quantitative)

Interval Data

- **Definition:** Numerical data with equal intervals, but **no true zero point**.

- **Examples:**

- o Temperature in Celsius or Fahrenheit (0°C ≠ "no temperature").

- o Calendar years (2020, 2021).

- **Trick to Guess:** Look for numbers where **zero doesn't mean "nothing."**

    - o *Question clue:* "What is the temperature outside?" → **Interval.**

Ratio Data

- **Definition:** Numerical data with equal intervals **and a true zero point**.

- **Examples:**

    - o Height (0 feet means no height).

    - o Weight (0 kg means no weight).

    - o Salary (0 dollars means no salary).

- **Trick to Guess:** Look for numbers where **zero means "none."**

    - o *Question clue:* "How much does this item weigh?" → **Ratio.**

Cheat Sheet: Quick Tricks

Type	Key Words to Look For	Examples
Qualitative	Categories, labels, descriptions	Colors, transport modes, favorite movie
Quantitative	Numbers, measurements, calculations	Age, height, scores
Nominal	No order, just labels	Gender, fruit types, eye color
Ordinal	Ordered categories, ranks	Satisfaction levels, education levels
Continuous	Any value, measurements, decimals	Height, weight, temperature
Discrete	Countable items, whole numbers	Number of pets, number of cars
Interval	Numbers, no true zero	Temperature, years
Ratio	Numbers, true zero exists	Height, weight, income

Practice Questions

1. *"What is the population of Ireland?"*

    - o **Answer:** Quantitative, Discrete, Ratio.

2. *"What is your preferred mode of transport?"*

    - o **Answer:** Qualitative, Nominal.

3. *"How tall are you?"*

- o **Answer:** Quantitative, Continuous, Ratio.

4. *"What is the year of your birth?"*

- o **Answer:** Quantitative, Discrete, Interval.

5. *"How would you rate the service quality?"*

- o **Answer:** Qualitative, Ordinal.

Key to Success

1. **Identify the type of data** (categories or numbers?).

2. **Check if there is order or ranking** (nominal vs. ordinal).

3. **Decide if it's measurable or countable** (continuous vs. discrete).

4. **Check for a true zero point** (interval vs. ratio).

Good luck on your exam! You've got this! 😊

Here's a simple guide to understanding the **Big Data Pipeline**—**gathering, processing, analyzing, presenting, and preserving**—along with tricks to identify the right step from a statement.

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1. Gathering

- **Definition:** Collecting raw data from different sources.

- **Examples:**

  - o Scraping data from websites.

  - o Pulling records from sensors or APIs.

  - o Survey responses.

- **Trick to Guess:** Look for words like **collect, acquire, fetch, or gather**.

  - o *Question clue:* "Getting traffic data from Dublin's cameras." → **Gathering.**

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2. Processing

- **Definition:** Cleaning, filtering, and transforming raw data into a usable format.

- **Examples:**

  - o Removing duplicates from a dataset.

  - o Normalizing data (e.g., formatting dates to DD-MM-YYYY).

- Converting file formats (e.g., CSV to JSON).
- **Trick to Guess:** Look for words like **clean, prepare, transform, or structure.**
  - *Question clue:* "Removing invalid survey entries." → **Processing.**

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3. Analyzing

- **Definition:** Extracting insights and patterns from the processed data.
- **Examples:**
  - Calculating the average commute time.
  - Building predictive models (e.g., forecasting sales).
  - Identifying trends (e.g., increase in remote working).
- **Trick to Guess:** Look for words like **calculate, predict, pattern, insight, or analyze.**
  - *Question clue:* "Identifying the busiest commuting times." → **Analyzing.**

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4. Presenting

- **Definition:** Communicating insights visually or in reports.
- **Examples:**
  - Creating charts and dashboards.
  - Writing a report for policymakers.
  - Delivering a presentation on findings.
- **Trick to Guess:** Look for words like **visualize, present, communicate, or report.**
  - *Question clue:* "Building a dashboard to show footfall trends." → **Presenting.**

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5. Preserving

- **Definition:** Storing data and results for future use or compliance.
- **Examples:**
  - Archiving historical traffic data.
  - Backing up analysis results to the cloud.
  - Creating a database for future queries.
- **Trick to Guess:** Look for words like **store, archive, save, or retain.**
  - *Question clue:* "Saving the analysis results for policymaking." → **Preserving.**

Cheat Sheet: Big Data Pipeline

Step	What Happens Here	Key Words	Examples
Gathering	Collecting raw data from sources	Collect, fetch, scrape, gather	Fetching footfall data from sensors
Processing	Cleaning and preparing raw data for analysis	Clean, prepare, transform, format	Removing invalid entries, formatting dates
Analyzing	Extracting patterns, trends, or insights	Analyze, predict, calculate, trend	Identifying peak commuting times
Presenting	Communicating findings visually or in reports	Present, visualize, communicate, report	Creating a bar chart of survey results
Preserving	Storing data/results for future use or compliance	Store, archive, save, backup	Saving cleaned data to a database

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Practice Questions

1. **Question Statement:**
   "Removing outliers from traffic data for Dublin."

   o **Answer:** Processing.

2. **Question Statement:**
   "Forecasting the number of people commuting next year."

   o **Answer:** Analyzing.

3. **Question Statement:**
   "Gathering survey data from employees on remote working."

   o **Answer:** Gathering.

4. **Question Statement:**
   "Creating a heat map showing pedestrian traffic."

   o **Answer:** Presenting.

5. **Question Statement:**
   "Storing historical weather data for comparison."

   o **Answer:** Preserving.

Key to Success

1. **Focus on the action in the statement:**

   o **Getting data?** → Gathering.

   o **Cleaning or fixing data?** → Processing.

- o **Finding patterns or insights?** → Analyzing.

- o **Making a visual or report?** → Presenting.

- o **Saving or archiving data?** → Preserving.

With this, you'll ace your questions about the Big Data Pipeline! Good luck! 😊