Notes:

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**A hand holding a notebook with writing on it

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**✅ Question 1**

**Q:** The variable is categorical. What chart should you use?  
**A:** Use a **Bar Chart**.  
📌 *Why?* Bar charts are best for showing the frequency of categories (like gender, blood type).

**✅ Question 2**

**Q:** What does 54.2% refer to in SPSS output for gender?  
**A:** That’s the **Valid Percent** — the percentage *excluding* missing responses.  
📌 *Why?* It shows the percentage **only among people who answered** the question.

**✅ Question 3**

**Q:** What happens in a normal distribution?  
**A:** The **mean, median, and mode are equal**.  
📌 *Why?* Normal distribution is symmetrical — most values cluster around the center.

**✅ Question 4**

**Q:** What’s the best way to describe a skewed variable?  
**A:** Use the **median and min–max**, not the mean and SD.  
📌 *Why?* Mean and SD are sensitive to outliers and skewness — median is more stable.

**✅ Question 5**

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**✅ Question 6**

**Q:** Interpreting the “pleasant” and “unpleasant” boxplots:  
**A:**

* The **“pleasant”** group has an **outlier**.
* Both distributions are **skewed**.
* The **unpleasant** group has a **higher median**.
* The **pleasant** group has **more variability**.  
  📌 *Why?* Boxplots visually show skew, spread, medians, and outliers.

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**Tip for SPSS:**

If a variable has **value labels**, it’s often **categorical** (even if stored as numbers). If it’s **measured in real units or amounts**, it’s likely **numerical** (interval or ratio).

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Categorical DATA

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Numerical Data

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Knowledge check:

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**🧠 Why Do We Use Statistics?**

* We can't predict what **one person** will do, but we can understand how **groups of people** behave.
* Statistics helps us explain **why people differ** — in age, health, mood, etc.
* It lets us **make guesses about the population** by studying a **sample**

**🔍 What Is a Variable?**

* A **variable** is something that can change from person to person.
* Examples: age, gender, mood, number of children, blood pressure.
* Variables help us describe and compare people.

**🧱 Types of Variables**

There are **two main types**:

1. **Categorical (Qualitative)**
   * **Nominal:** Just names or labels (no order). E.g. blood group, gender.
   * **Ordinal:** Categories with a clear order. E.g. satisfaction levels (very satisfied → dissatisfied).
2. **Numerical (Quantitative)**
   * **Discrete:** Countable numbers. E.g. number of kids.
   * **Continuous:** Can take any value (even decimals). E.g. height, weight, age.

**How to Describe Categorical Data**

* We **count how many** people fall into each category — that’s called **frequency**.
* We also show this in **percentages**.
* Charts:
  + **Bar chart** for nominal and ordinal data.
  + **Pie chart** is for nominal data only.

**📈 How to Describe Numerical Data**

* Instead of counts, we use **summary measures**:
  + **Mean** = average
  + **Median** = middle value
  + **Mode** = most common value
  + **Standard Deviation (SD)** = how spread out the data is
  + **Range** = max - min
  + **IQR (Interquartile Range)** = difference between Q3 and Q1
* Charts:
  + **Histogram** = for showing distribution of numerical data.
  + **Boxplot** = for comparing groups.

**Skewed vs Normal Data**

* **Normal Distribution**: Mean ≈ Median ≈ Mode. Use **mean and SD**.
* **Skewed Data**: Use **median, min-max, and IQR**.
* **Categorical: Use Frequencies and Percentages**

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* **💻 SPSS Tips**
* To check variable summaries:  
  Analyze > Descriptive Statistics > Frequencies  
  (Uncheck frequency table if using numerical data)
* To create graphs:  
  Graphs > Legacy Dialogs > Bar / Pie / Histogram / Boxplot
* Use SPSS outputs to spot typos, outliers, or incorrect values.

**🔢 When to Use Frequencies**

✅ **Best for Categorical Variables** (nominal or ordinal)

**When to Use Descriptives**

✅ **Best for Numerical Variables** (continuous or discrete)

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Lecture slides How to: W1 L3-4

Qualitative (Categorical) Data

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Quantitative (Numerical) Data

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Descriptive indices:

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Chart:

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Box chart:

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How to do the box chart:

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Practical Quiz:

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A chart with green and pink squares

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Use “percent”, to describe.

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