

# DATA101 Comprehensive Long Quiz - Set A (Answer Key)

## 50-Point Assessment Document (Answer Key)



### DATA 101: Data Visualization

DE LA SALLE UNIVERSITY  
Long Quiz (50 points)

Semester: \_\_\_\_\_  
Section: \_\_\_\_\_

Name: \_\_\_\_\_ ID: \_\_\_\_\_ Date: \_\_\_\_\_

Instructions: Complete all questions. Use only one answer per matching item. Keep responses legible.

#### 1) MCQ (2 pts)

You receive the request: "Show if faculty performance dropped after policy change and identify who was helped." Which should be the first action before any chart is selected?

- A) Ask if the audience prefers a donut chart and then scale bars to that aspect ratio.
- B) Convert the request into explicit tasks and data requirements (output, action, constraints, audience).
- C) Normalize all metrics first and then choose a comparison template.
- D) Select a network view in case performance relationships need to be inferred.

Rank the best first three steps for a high-stakes comparison question from most important (1) to least important (4):

- A) Choose chart type.
- B) Write the task statement (action, target, constraints, output).
- C) Resolve attribute scales (units, rate vs count, missingness, temporal unit).
- D) Choose color palette.

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Answer: B.

#### 2) Matching (1 pt)

Match each statement to the abstraction error it most directly warns against.

- 1. "A line chart of attendance and satisfaction is shown without stating that one is per-capita and the other is raw count."
- 2. "A dashboard chooses a small-multiples layout for only 5 unique categories."
- 3. "A pie chart is proposed first, then variables are forced into three mutually exclusive slices."

Errors:

- A) Baseline mismatch and untracked granularity.
- B) Overengineering first-pass layout without task evidence.
- C) Chart-first trap.

Answer: 1) B, 2) C, 3) A, 4) D.

#### 5) Short answer (2 pts)

Rewrite this vague request into a defensible task statement template: "Compare city performance and detect anomalies in monthly support fulfillment."

Answer: Action: compare monthly fulfillment across cities and detect outlier months for intervention; Target: support-fulfillment records by city and month; Constraints: fixed baseline period, same denominator and missing-month treatment; Output: ranked city-month anomaly list with trend view and uncertainty.

Answer: 1→A, 2→B, 3→C.

#### 3) Multiple answers (2 pts)

Select all valid reasons to choose a dataset re-shape (tidy vs wide) before visualization.

- A) A single task asks for comparisons across regions and dates.
- B) A distribution task includes outliers that must be grouped by cohort and period.
- C) A dashboard will only show one value card and no interactions.
- D) A spatial overlay will join regions from different source systems.
- E) A line chart is requested and data are stored already in one JSON blob per entity.

#### 6) MCQ (2 pts)

Which mapping is least appropriate for precise magnitude comparison?

- A) Position on a shared baseline
- B) Length along aligned axes
- C) Hue hue-shading differences
- D) Ordered bar endpoints

Answer: C.

#### 7) Multiple answers (2 pts)

Choose all that are valid responses to the chart-reading rule "if attention is limited, reduce cognitive load."

- A) Keep one strong visual hierarchy and limit color categories in first view.
- B) Add dual-axis to expose hidden patterns in one panel.
- C) Use direct labels where possible instead of dense legend hunting.
- D) Add six new decorative icons for storytelling emphasis.
- E) Group related marks with proximity and shared space.

Answer: A, B, D.

#### 8) MCQ (2 pts)

Answer: A, C, E.

A chart displays a diverging political preference with a meaningful midpoint near zero. Which palette type is correct?

- A) Qualitative palette.
  - B) Sequential low-to-high palette.
  - C) Diverging palette anchored at midpoint.
  - D) Binary red/green pair for all classes.
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**Answer:** C.

### 9) Ranking (1 pt)

Order the perceptual pitfalls from highest to lowest impact on trust in a report:

1. Truncated y-axis, 2) inconsistent unit labels, 3) rainbow color ramp, 4) tiny legend.
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**Answer:**

### 10) Short answer (1 pt)

List one reliability check for color interpretation in a map/chart report.

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**Answer:** Ensure color semantics are consistent with variable meaning and provide redundant cues (pattern/labels/annotation) rather than relying on hue alone, plus CVD-safe contrast checks.

### 11) MCQ (2 pts)

You have 6 groups across 24 months with irregular missing dates and campaign interventions. The question is who improved most and who regressed fastest. Best approach?

- A) Single multi-line with all series and arbitrary interpolation.
  - B) Slope or indexed mini-trend comparison after harmonized time grid and normalization.
  - C) Two pie charts: before and after.
  - D) Boxplot per month and ignore campaign dates.
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**Answer:** B.

### 12) Multiple answers (2 pts)

For distribution comparison across groups, select all valid methods.

- A) Match binning strategy across groups before first-pass visual claims.
  - B) Use median-only charts when tails are central to interpretation.
  - C) Report n and scale choices in interpretation notes.
  - D) Prefer violin over histogram by default for small n.
  - E) Use log or Box-Cox transforms when skew is severe and interpretation remains documented.
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**Answer:** A, C, E.

### 13) Matching (1 pt)

Match each goal to the first table-based view choice.

1. Detect group medians and trend shifts over time.
2. Detect heavy-tailed spread shifts.
3. Detect rank changes only for top 5 entities.
- i) Small multiples + trend/quantile panel.

- ii) Distribution glyph (violin/box with CI or whiskers).
  - iii) Focused slope/ranker chart after top-k filtering.
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**Answer:** 1→i, 2→ii, 3→iii.

### 14) Short answer (2 pts)

A stakeholder asks for "fastest changing cohorts" using a dataset with huge within-group variance. What single preprocessing guard should precede your chart choice?

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**Answer:** Stabilize sampling intervals and align all observations to an explicit time basis (or explicitly model irregular intervals) so slope/rank calculations are comparable across cohorts.

### 15) Ranking (1 pt)

Rank these tasks by the degree of information loss if forced into a single chart from most to least harmful:

- A) Compare two cohorts' medians by month.
  - B) Show outlier bursts for each cohort.
  - C) Compare within-cohort variance and spread change.
  - D) Identify the fastest-growing and fastest-declining entities.
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**Answer:** 1) C, 2) B, 3) D, 4) A.

### 16) MCQ (2 pts)

An ops room needs shared state and role-specific views. Best first-pass composition?

- A) Duplicate full dashboard for each role.
  - B) Keep only one global chart with all controls open.
  - C) Overview strip + diagnostic modules + action lane, with progressive disclosure.
  - D) Separate pages and no shared interactions.
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**Answer:** C.

### 17) Multiple answers (1 pt)

Which changes reduce dashboard ambiguity?

- A) Centralized scale registry for metric semantics.
  - B) One state store shared across coordinated views.
  - C) Hide infrequent actions under advanced controls.
  - D) Separate unrelated filters per view by default.
  - E) Reuse a single tooltip format across every module.
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**Answer:** A, B, C, E.

### 18) Matching (1 pt)

Match each pattern to intended outcome.

- 1. Overview then decision lanes.
- 2. Hide/show controls by intent.
- 3. Operative cockpit with synchronized interactions.
- i) reduce cognitive split between context and action.
- ii) preserve shared analytical continuity.

iii) reduce visual noise and protect first load speed.

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**Answer:** 1→i, 2→iii, 3→ii.

### 19) Short answer (2 pts)

A dashboard has 5 KPIs, 4 actions, and 8 filters but users complain about fatigue. Specify default visibility versus hidden controls.

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**Answer:** Keep high-signal KPIs + current state/time horizon visible; expose secondary filters/actions in drawers and reveal deeper diagnostics only after user intent or drill state so working set remains small by default.

### 20) MCQ (1 pt)

You need community structure + bridge detection on 25k sparse nodes for executives. Best pairing?

- A) Node-link only, no edge weight.
- B) Matrix only, no ordering.
- C) Hybrid node-link overview + matrix for dense clusters.
- D) Treemap of degree counts only.

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**Answer:** C.

### 21) Multiple answers (1 pt)

Select all valid reasons to add a matrix view alongside node-link.

- A) Dense/near-complete regions create entangled edge crossings.
- B) Need to inspect block structure and co-membership.
- C) Need intuitive path tracing at first pass for stakeholders.
- D) Need to inspect asymmetry and edge direction.
- E) Need to keep node labels always visible without hover.

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**Answer:** A, B.

### 22) Short answer (2 pts)

For directed-signed graphs, which fields are required and how should polarity and strength be separated in encoding?

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**Answer:** Use source, target, weight, and sign/polarity (plus optional time/type fields); encode polarity with hue/arrow orientation and strength via line width/opacity/brightness so channels do not collapse sign and magnitude.

### 23) Matching (1 pt)

Match task and graph layout.

1. Report allocation share by branch.
2. Highlight bridge nodes and cut-edges.
3. Inspect dense community blocks quickly.

- A) Node-link primary + matrix secondary.
- B) Treemap primary + node-link secondary.
- C) Matrix primary + node-link secondary.

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**Answer:** 1→B, 2→A, 3→C.

### 24) Ranking (1 pt)

Order interaction priorities for a live graph brief from highest to lowest: 1) Community toggle, 2) Degree filter slider, 3) Link strength legend, 4) Animated force transition.

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**Answer:** 1) Degree filter slider, 2) Community toggle, 3) Link strength legend, 4) Animated force transition.

### 25) MCQ (1 pt)

You compare incidence in uneven counties with many low-population areas. Best baseline choice?

- A) Raw counts in choropleth classes.
- B) Per-capita rates with explicit normalization and binning rationale.
- C) Bubble map only.
- D) Equal-area projection with no distance claims.

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**Answer:** B.

### 26) Multiple answers (2 pts)

Which are high-risk pitfalls in spatial interpretation?

- A) MAUP from boundary changes.
- B) Ecological inference.
- C) Ignoring symbol overlap scaling in overlays.
- D) Using CVD-safe colors only.
- E) Ignoring projection distortion when discussing distance.

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**Answer:** A, B, C, E.

### 27) Short answer (2 pts)

You publish a choropleth plus symbol map on the same indicator. State one essential pre-publish validation.

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**Answer:** Verify denominators/time frame and scale semantics are aligned so color classes and symbol magnitudes map the same underlying quantity and do not imply contradictory ordering.

### 28) MCQ (2 pts)

For publication-quality vector slides and precise labels in a PDF workflow, which default output is usually strongest?

- A) PNG only.
- B) GIF animations.
- C) SVG exports from charts that support it.
- D) Screenshot-only outputs.

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**Answer:** C.

### 29) Multiple answers (1 pt)

Select all that are valid reasons to prefer HTML over raster outputs.

- A) Need built-in hover tooltips and interaction.
- B) Need lightweight, fully static printing at 300 DPI.
- C) Need lightweight sharing in a browser and scriptable interactions.

- D) Team has inconsistent browsers and no JS support.  
E) Need crisp scaling of text and paths in web reports.
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- D) Spatial maps first, then all other visualization types.
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**Answer:** A, C, E.

### 30) Matching (1 pt)

Match the phrase to its primary implication.

1. "Inputs → function → outputs" in app design.
  2. "Good defaults" in interactive charts.
  3. "Visible state reset".
    - i) Core callback architecture.
    - ii) Interaction should work before hovering.
    - iii) Undoable state prevents misinterpretation.
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**Answer:** 1→i, 2→ii, 3→iii.

### 31) MCQ (1 pt)

A chart interaction works only on hover and fails when captured for review.  
What is the most defensible redesign?

- A) Keep hover logic and hide issue from static view.
  - B) Remove interactivity completely.
  - C) Add persistent labels/default callouts + non-hover fallback while preserving hover detail-on-demand.
  - D) Increase tooltip font size only.
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**Answer:** C.

### 32) Multiple answers (1 pt)

When building cross-module dashboards with interaction, choose all required guardrails.

- A) Central interaction bus for filters and highlight state.
  - B) Fixed scales across module switches.
  - C) Independent legend meaning per module.
  - D) Clear export/readiness checks per output format.
  - E) One global data cache only for static screenshots.
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**Answer:** A, B, D.

### 33) Integrative scenario (1 pt)

You must build one page with: (i) abstraction-first pipeline, (ii) tabular trend, (iii) dashboard interaction, (iv) graph module, (v) spatial overlay, and (vi) web-app export. In one sentence, propose a defensible sequence of implementation checkpoints.

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**Answer:**

### 34) MCQ (1 pt)

For a new long-form course module, which sequence should come first in a tight instruction flow?

- A) Proofs first, visuals second, case studies last.
- B) Plan and outcomes first, then practical design sequence.
- C) Interactivity demos first, then abstraction.