

Case Study 1: Visualization Critique

DAT-230 Data Visualization & Storytelling with AI

Instructor: Dr. Vikas Thammanna Gowda Semester: Fall 2025
Contact: vthammannagowda@champlain.edu Office Location: West Hall 100
Office Hours: TBD

Case Study: Analyzing complete and incomplete plots

Assigned Date: 09/01/2025

Due Date: 09/08/2025

1 Overview:

In this exercise, you'll explore two complete charts and two deliberately "unfinished" charts (omitting titles, axis labels, or legends). First, you'll interpret the complete graphs to extract key insights. Then you'll diagnose what's missing in the incomplete ones and suggest the labels, titles, or design tweaks needed to make them equally clear and informative. You will complete one set of graphs in class and the other set at home.

1.1 Submission & Grading Policies

Section	Format	Due Date	Points
2.1 Complete Graph A	In-class	During class (graded live)	25
2.2 Incomplete Graph A	In-class	During class (graded live)	25
3.1 Complete Graph B	Homework	09/08/2025	25
3.2 Incomplete Graph B	Homework	09/08/2025	25
Total			100

1.2 Submission Guidelines

In-Class Sections (1 & 2)

- Students work on Sections 1 and 2 first.
- The instructor circulates, reviews, and grades these two sections in real time.
- Once graded, students continue directly to the homework sections on the same sheet.

Homework Sections (3 & 4)

- Complete Sections 3 and 4 at home using the same worksheet.
- Submit the full worksheet (all four sections) to the instructor at the beginning of the class on the due date.

2 In-Class Activity

2.1 Complete Graph A

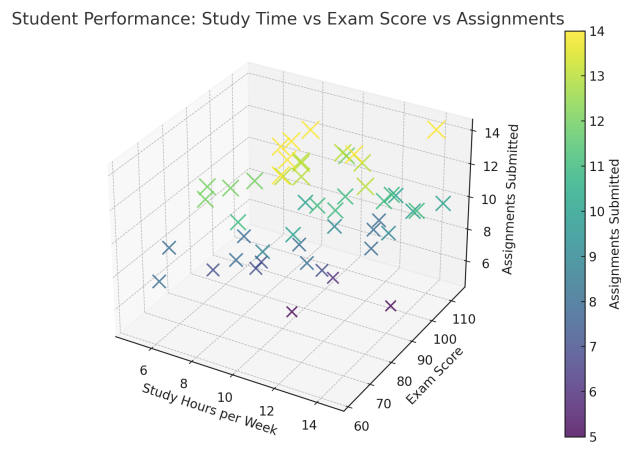


Figure 1: Student Performance: Study Time Vs Exam Score Vs Assignments

In the above Figure:

1. Describe the relationship between study hours and exam scores. Is there a clear trend?
2. How does the number of assignments submitted (color/size) relate to exam performance?
3. Identify any outliers (e.g., students with high study hours but low scores). What might explain these cases?

4. Do you see clusters of students with similar study habits and performance?
5. How does combining three dimensions (X, Y, and Z) in one plot help (or hinder) understanding?
6. Propose another way (e.g., 2D pairwise scatter plots, bubble chart, heatmap) to represent these three variables without using 3D.

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2.2 Incomplete Graph A

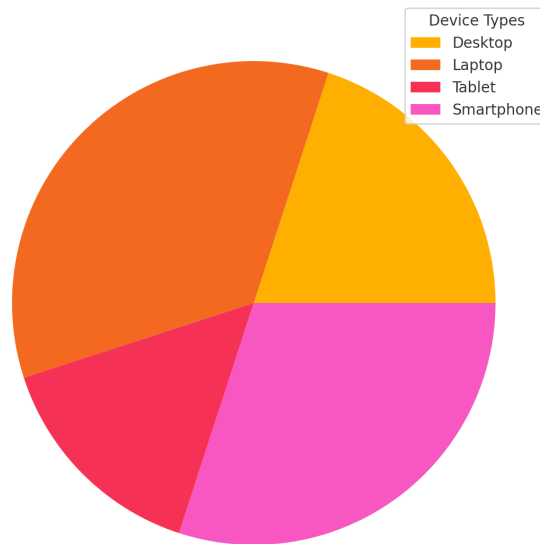


Figure 2: Distribution of device types in a company

In the above Figure:

1. What key information is still missing?

2. Without slice labels or a title, how would you describe what this chart represents?

3. Which device appears most common? How confident are you without percentage annotations?

4. How would adding % values change your ability to interpret the data?
5. Would you adjust colors, explode any slice, or change the start angle? Why?
6. What story does this visualization tell?
7. Are pie charts always the best choice for showing this kind of distribution? When might a bar chart be more effective?
8. What potential biases or misinterpretations can arise from an incomplete or poorly annotated pie chart?

3 Homework

3.1 Complete Graph A

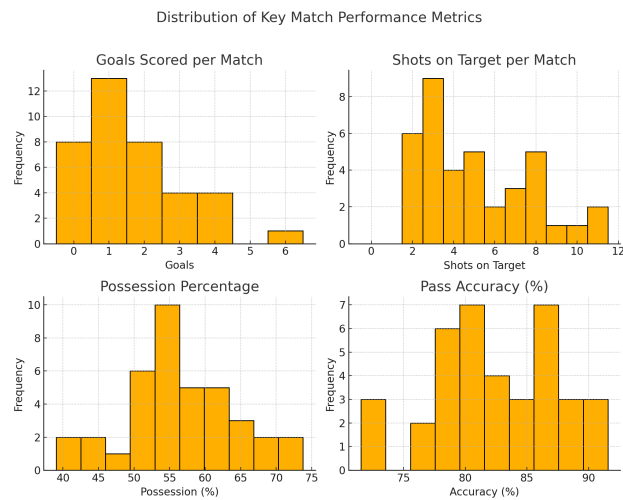


Figure 3: Student Performance: Study Time Vs Exam Score Vs Assignments

In the above Figure:

1. Which distribution appears approximately normal?
2. Looking at all four charts together, what overall story about the team's season stands out to you?
3. Which aspect (scoring, shooting, possession, passing) would you praise as a strong point?

4. Which area might you worry needs work?
5. Imagine you're writing a short match report. Pick one histogram and describe what it tells a casual fan about how the team played.
6. If you were sharing these visuals on social media, which one would generate the most interesting conversation? What headline would you pair with it?

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3.2 Incomplete Graph A

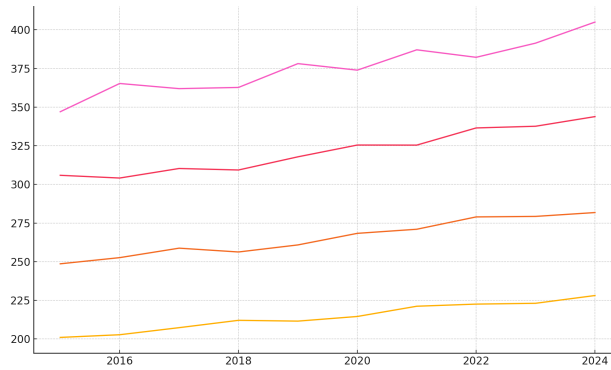


Figure 4: Median Property Prices over 10 Years.

In the above Figure:

1. What information is unclear or missing in this visualization?

2. How would they improve it?

3. Are there any other enhancements they'd recommend?

4. What story does this visualization tell?

5. Are there any potential different plots that could be used to tell the same story?

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