General Graph Design

Show Me the Numbers Ch.9

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Quantitative Communication via Graphs

Two fundamental principles of quantitative communication:

1. Maintain visual correspondence to quantity
2. Avoid 3D

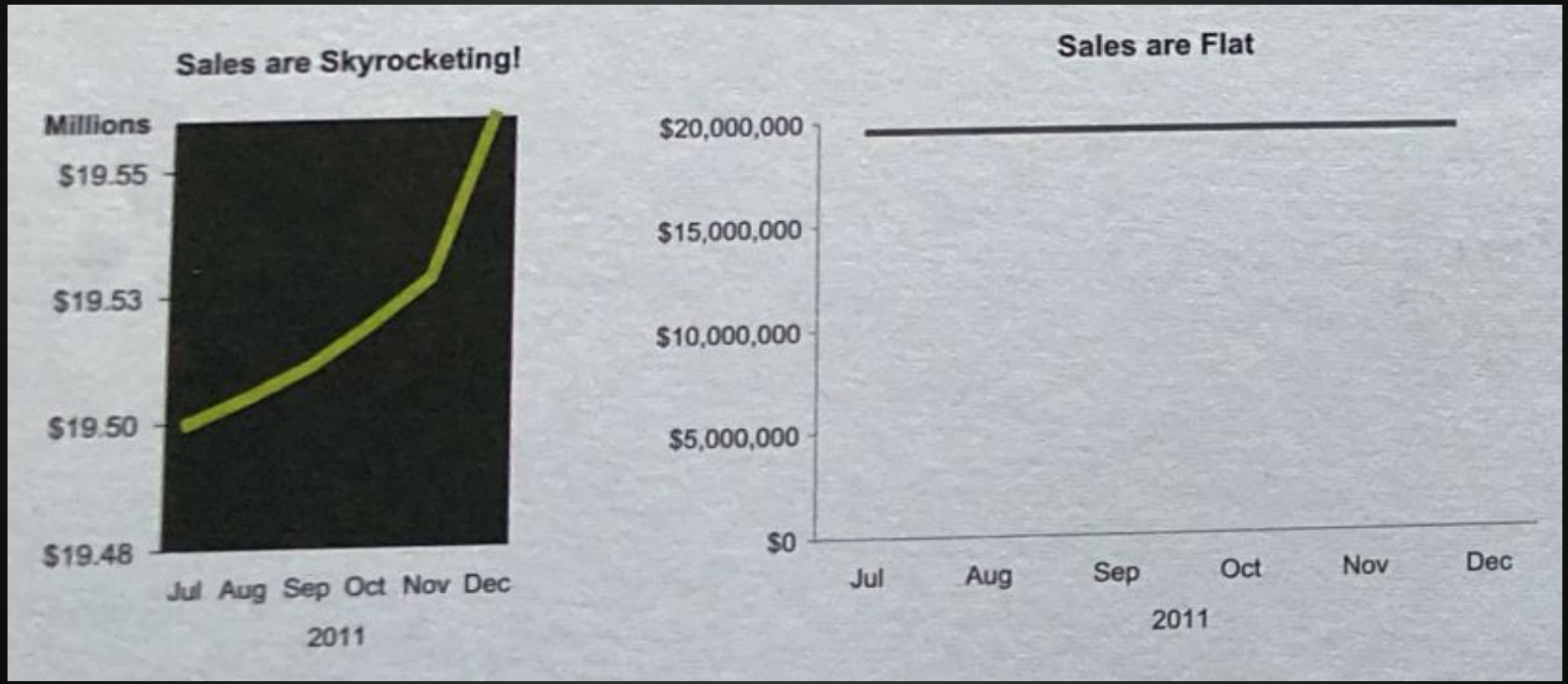
Maintain Visual Correspondence to Quantity

Two attributes of visual perception that are easily and accurately interpreted:

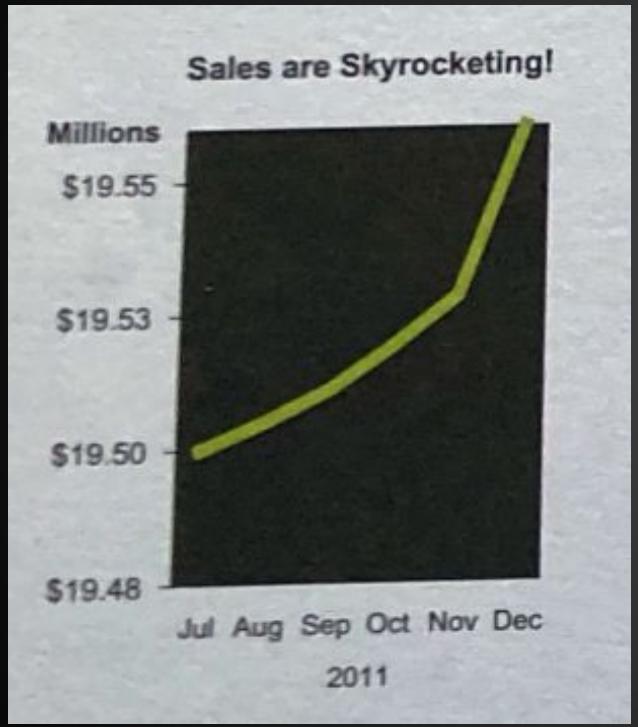
1. Length (bars, boxes)
2. 2D position (points, lines)

These attributes scale well when properly done, but this is also easily manipulated.

Deliberate Misinformation



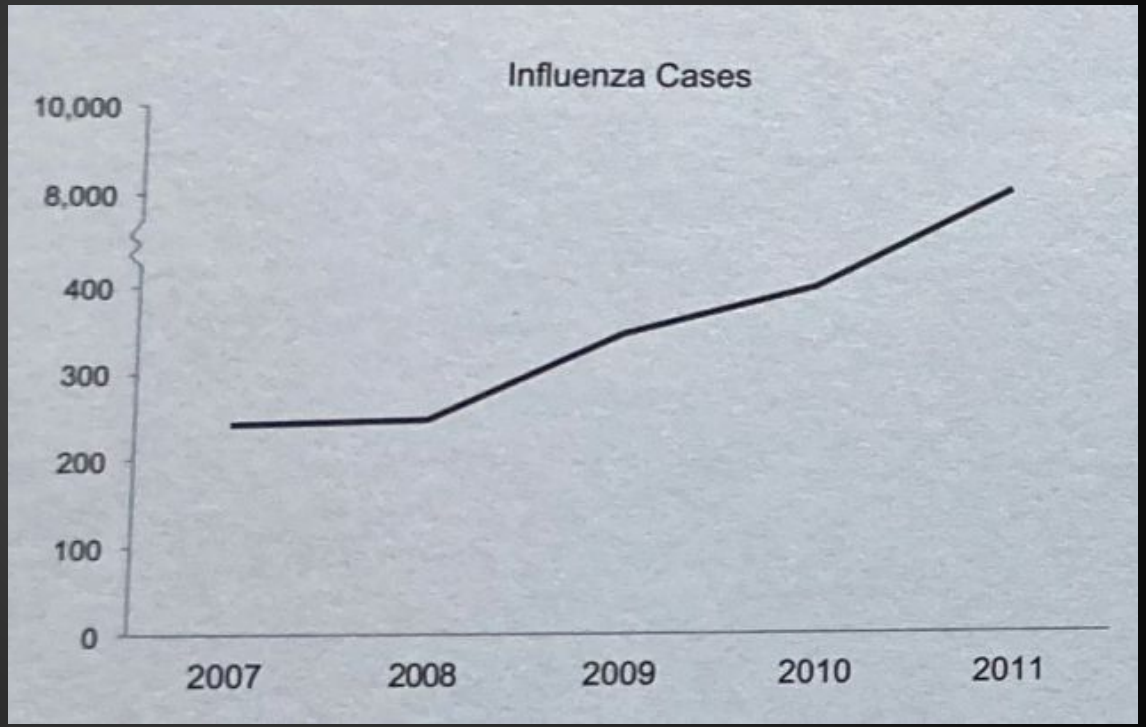
5 Falsifying Design Characteristics



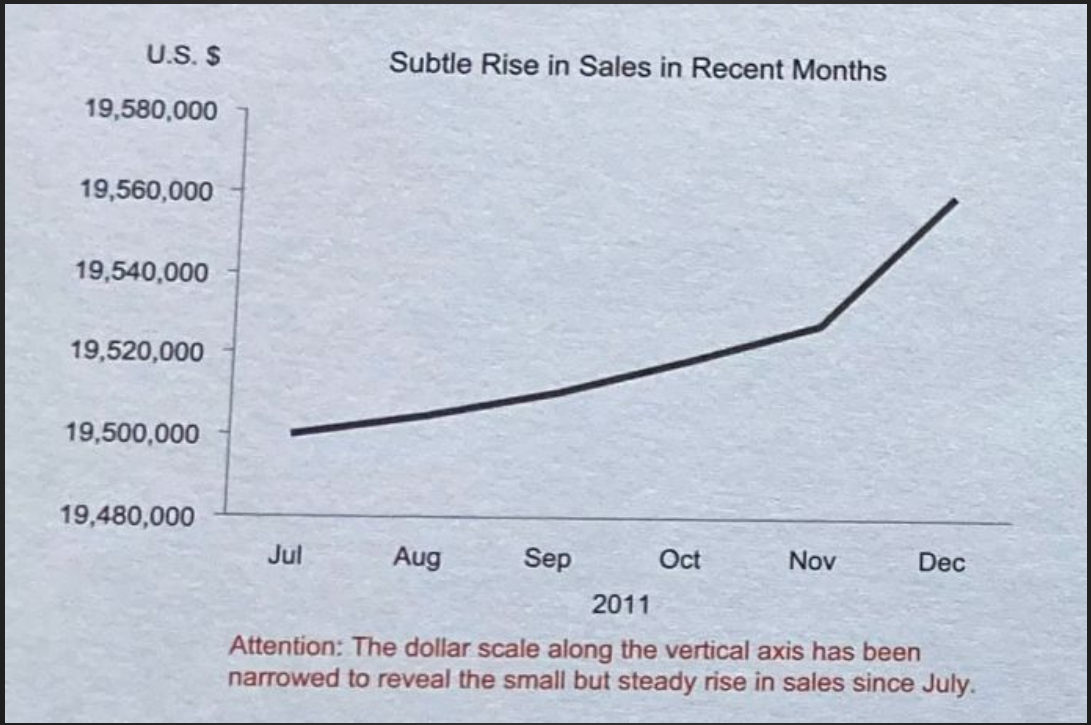
1. The scale on the Y axis does not start 0.
2. The plot area of the graph is taller than it is wide.
3. The line is green.
4. The highest value is set as the top of the scale.
5. The placement of the boldface axis label Millions.

Correspondence to Tick Marks

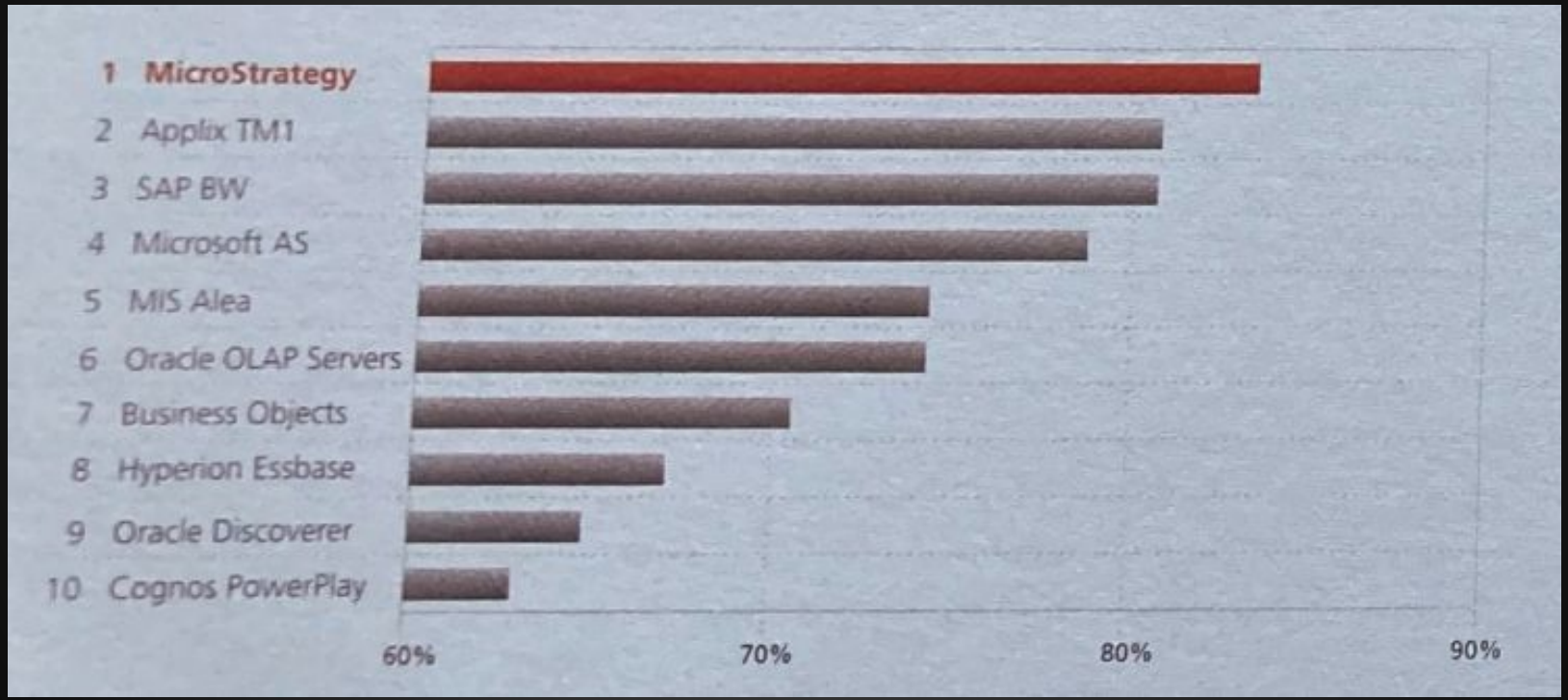
Breaks in the quantitative scale are misleading and don't accurately represent the information.



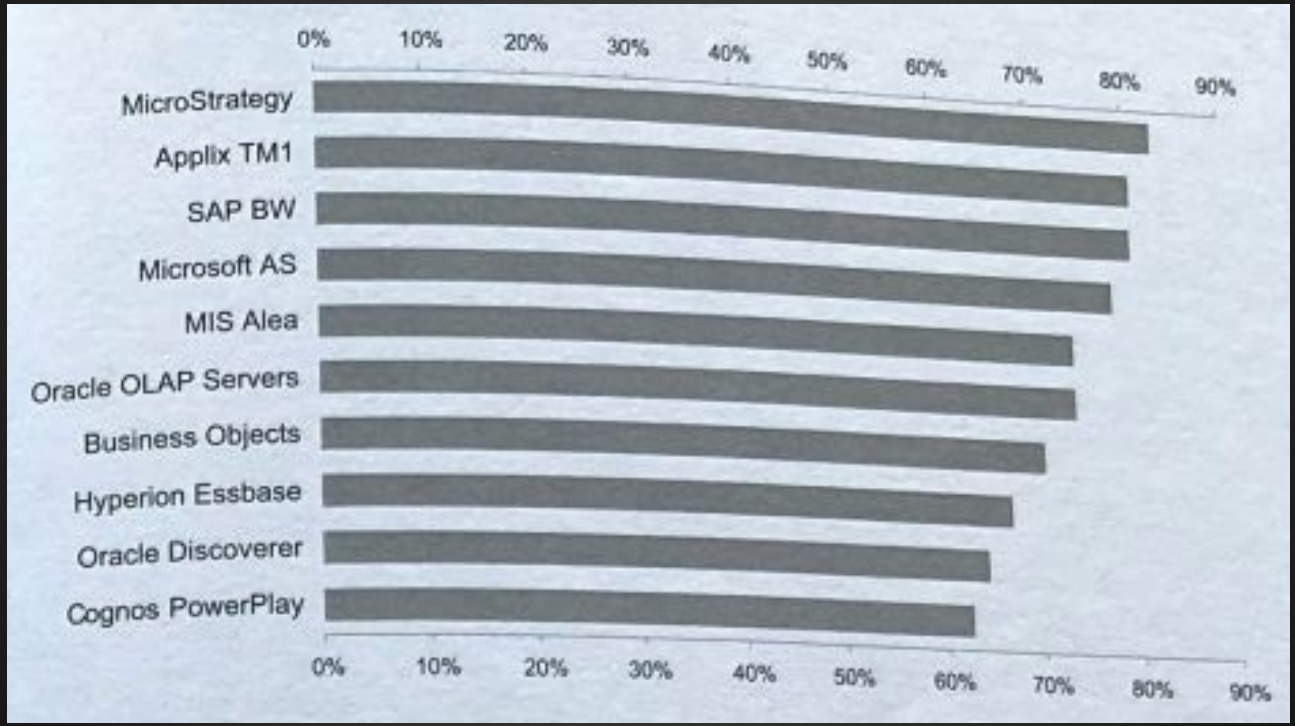
Zero-Based Scales



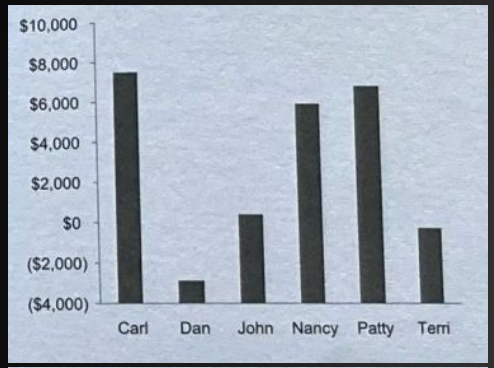
Zero-Based Scales - Bars



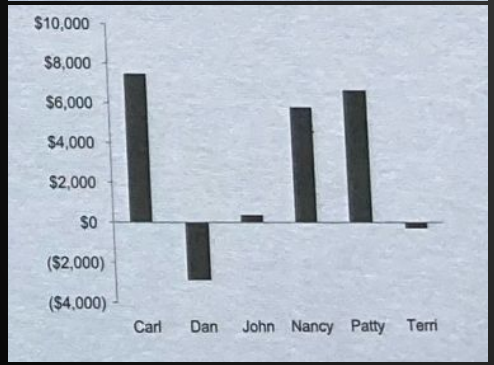
Zero-Based Scales - Bars



Zero-Based Scales - Bars



→ Incorrectly sets the base of its scale to the lowest value.



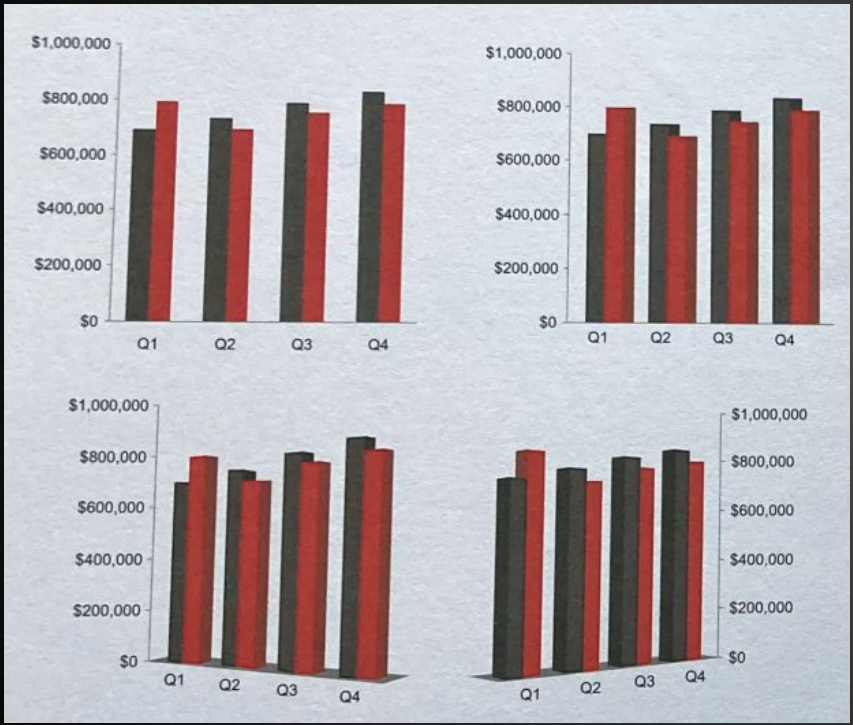
→ Correctly sets zero as the base of its scale at the point where the X axis intersects the Y axis.

Avoid 3D

Two ways to display graphs using 3D:

1. Adding a third dimension of depth to objects that are used to encode quantitative values without the addition of a third quantitative scale.
2. Adding a third dimension of depth to the overall graph with an associated quantitative scale.

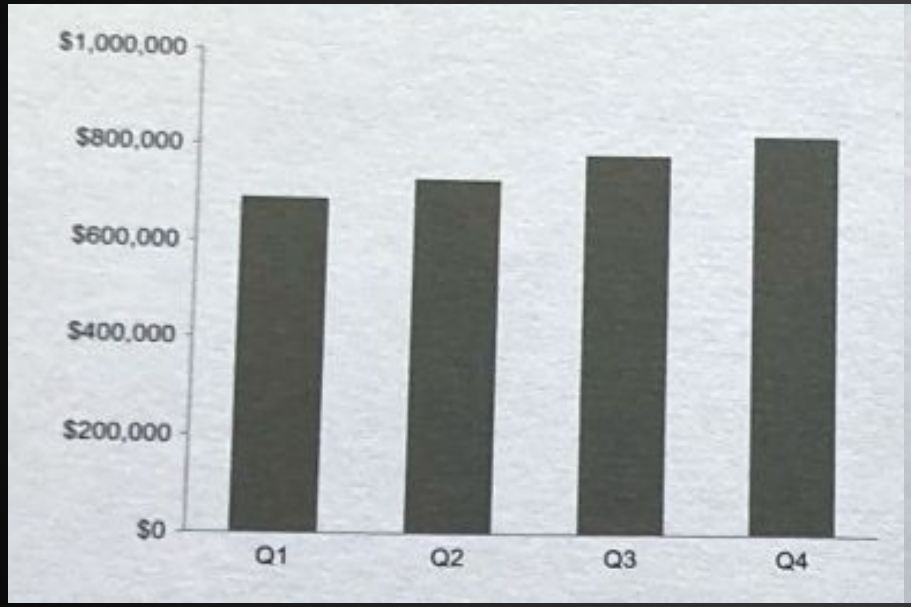
Data Objects with 3D Depth

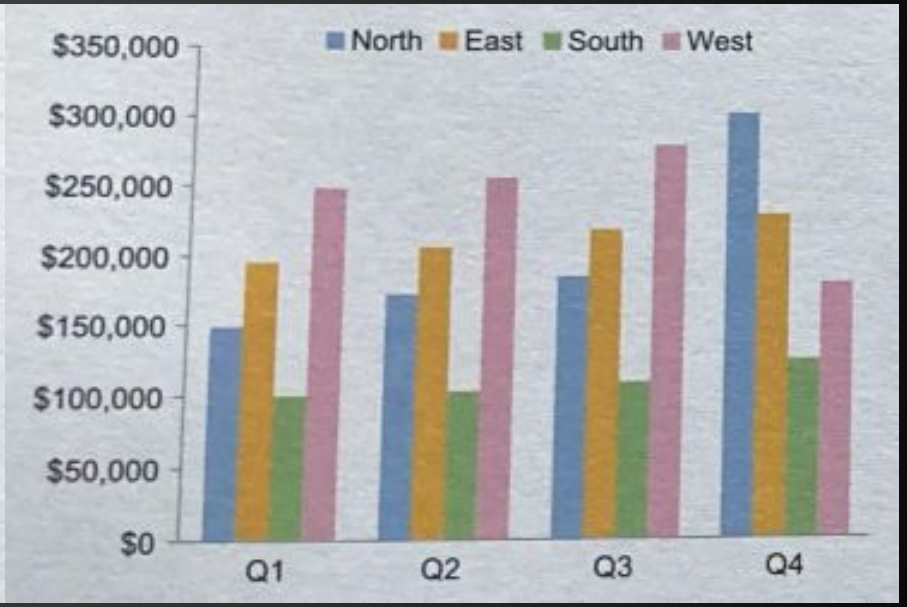


Issues:

1. The addition of depth does not add anything to the object's value.
2. Adding a 3D element makes the graph harder to read.

Graphs With 3D Depth

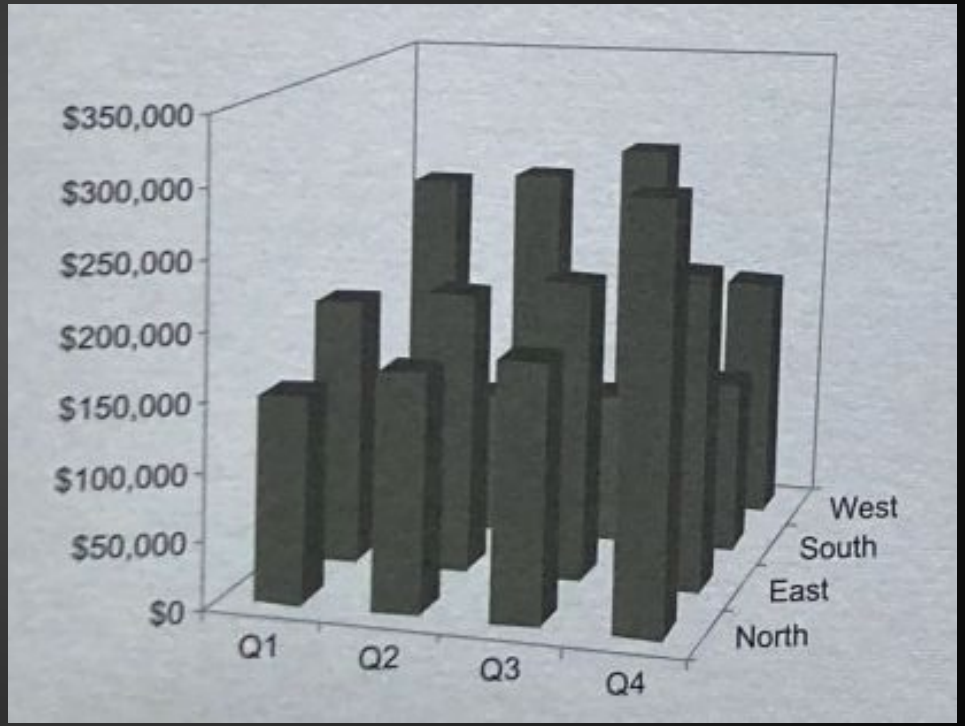




Graphs With 3D Depth

Adding perspective:

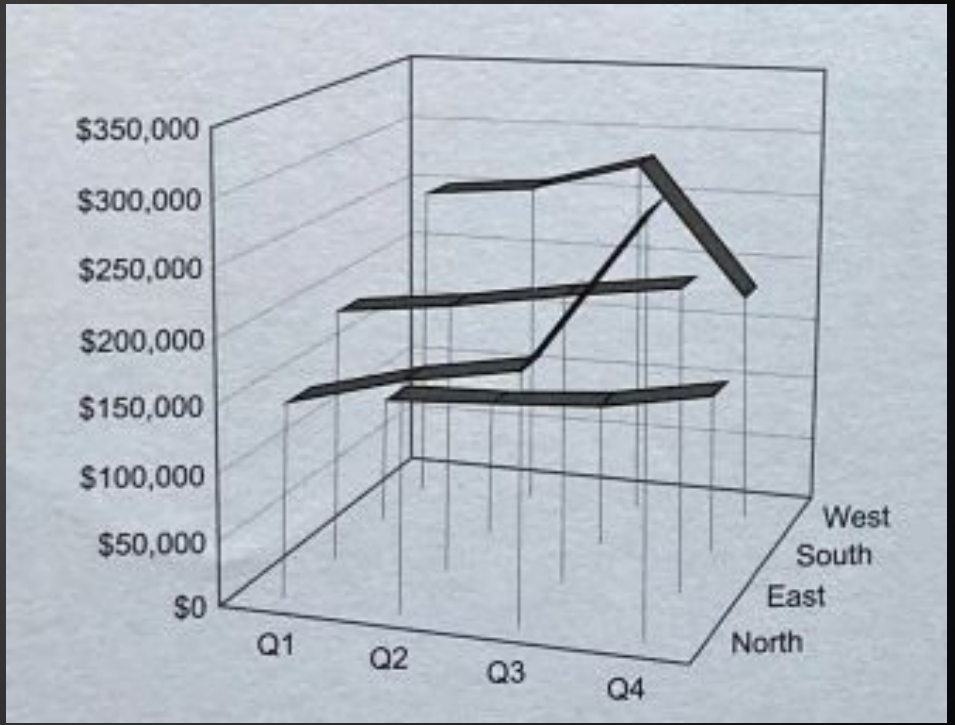
- *Axonometric Projection*
- Attempts to make the graph easier to read.
- Never able to view all bars.



Graphs With 3D Depth

Still has the same issues:

- The *drop lines* are difficult to follow.
- Cluttered and misleading.



Key Points

- Encode quantities to correspond accurately to the visual scale.
  - Keep the distance between tick marks on a scale line consistent with the difference in the quantitative values that they represent.
  - Include the value zero in your quantitative scale and alert readers when you don’t. Always start the quantitative scale at zero when you use bars.
- Avoid 3D displays of quantitative data.

Questions?