Reference: Data Visualization with Tableau specialization UC Davis Coursera

Fundamentals of Visualization with Tableau

1) Why is data visualization important? What makes a a good data visualization?

1. Connect to the audience instantly
2. Spot patterns
3. Make decisions faster
4. Improve understanding
5. Bridge gap between info and actionable insights

2) T/F Your brain process visuals 60,000 times faster than text.

True.

3) Give an example of a good Tableau dashboard.

Johns Hopkins COVID-19 dashboard

4) How can Tableau help identify trends and patterns?

1. Time-series charts
2. moving averages
3. Forecasting tools

5) How can you test hypotheses with Tableau?

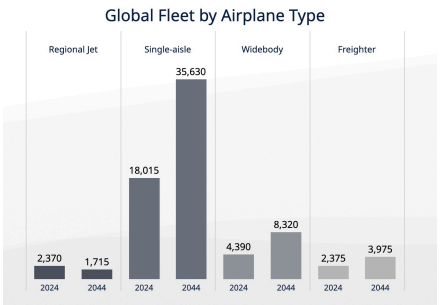
compare findings using before treatment vs after

6) Why are outliers considered?

Help identify problem or opportunity

7) What is an example of a dashboard that draw comparisons?

Which aircraft type will see the most demand over next 20 years?



(Boeing current market outlook 2024-2044)

8) What does driving decision-making mean?

Help people take the right next steps

9) Who pioneered the field of data visualization?

Professor Edward Tufte (ET)

know your audience.

1) If it's for executives, _____.

quick takeaways

2) If it's for anaysts, _____.

deepdive

3) If it's for general audience, _____.

more context

Charts

1) What are bar charts, line charts, scatter plots Used for?

bar charts for comparisons; line charts for trends; scatterplot for relationships

2) T/F Simple charts are better.

True

Misconceptions of Data Visualization

1) To maximize data visualization, what else would you also need to master?

1. design choice
2. structuring data
3. Story tell your data
4. Using the tool very well

Resources

1. Where can you find 10 best data Visualization examples from History & Today?

Data is Beautiful

2. Where can you learn more about principles of clear and effective visual communication?

Envisioning Information by ET

3. Where can you learn to use different charts effectively?

Data Viz Project

4. Where can you learn how to spot misrepresented data?

How to Spot Data Lies by Nathan Yau

Getting to know Tableau

1) What are the two different Tableau options?

Pubic and Desktop

1a) Which one has the paid license?

Desktop (subscription required)

2) Differences between public and desktop.

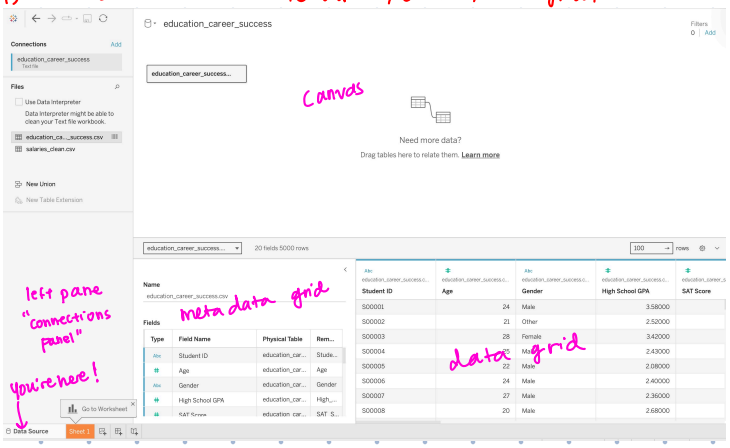
public	desktop	features
X	✓	connect to databases, cloud platforms, live data sources, and spreadsheet
✓	✓	connect to local files excel or csv
X	✓	unlimited row count
✓	✓	15 million row count
X	✓	Dashboards can be private and shareable to selective people
X	✓	schedule updated data
X	✓	who's viewing dashboard and performance

3) What is the file type of CSV?

(A) Text file
(B) JSON
(C) Spatial
(D) Statistical

A, Text file

4) What do each section: left pane, canvas, data grid, and meta data grid do?



left pane: displays the connected data source and other details

canvas: view data source and create relationships between sources

data grid: gives preview of first 10,000 rows of data

metadata grid: displays the fields in your data source as rows

5) T/F Tableau automatically assigns types to fields (aka features). Sometimes, you may need to adjust them.

True

6) What are the data type icons in Tableau?

Data type icons in Tableau

Icon	Data type
Abc	Text (string) values
	Date values
	Date & Time values
#	Numerical values (integer or decimal)
T/F	Boolean values (relational only)
	Geographic values (used with maps)
	Image role (used with image link URLs)
	Cluster Group (used with Find Clusters in Data)

7) What is saved when you save your workbook on Tableau public as .twb?

structure, connections, and visualizations (without the data!)

7a) What is .twb best for?

live connections to external databases

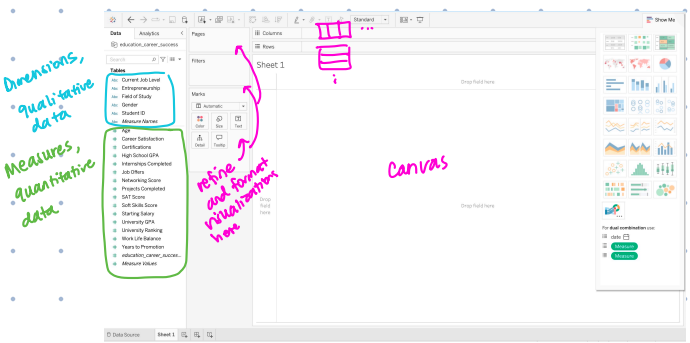
8) What is saved when you save your workbook as .twtw?

workbook and any local data sources

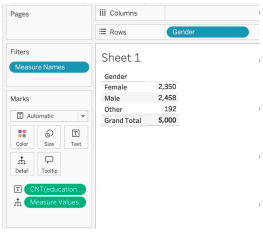
8a) What is .twtw ideal for?

sharing with others

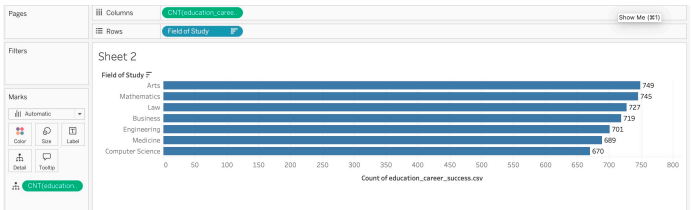
9) What is the difference between dimension and measure?



10) Display the count of genders. Then, also display the total.



11) Create a bar chart of the different fields sorted from largest to smallest.



12) What is PII?

Personally Identifiable Information, any data that can be used to identify a specific individual.

12a) Give examples.

names, addresses, social security number, email address

12b) T/F You should hide PII data.

True

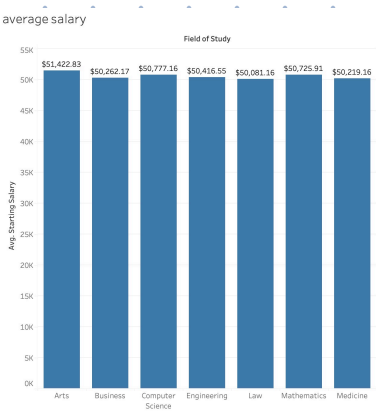
12c) If the sample size of gender was low, how can you display the data to hide PII?

Make it into percentages → calculate percentage total with dropdown.

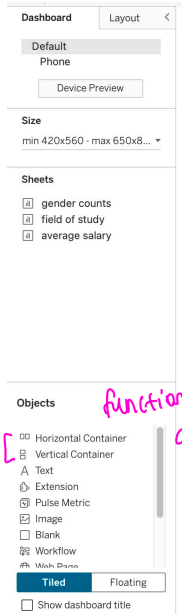
13) T/F The best practice for combining views per dashboard is 2-3 views.

True

14) Make the average starting salary for each field as a bar chart.



(5)



canvas

aka layout containers

functionality & appearance

16) What is the difference be tiled and floating containers?

tiled containers click in place while floating containers can be dragged freely.

17) Make a dashboard for all three visualizations using horizontal and vertical containers.

Steps to do simple Data Visualizations

1. Download the data set.
2. Open Tableau and load the dataset.
   A. When loading a csv file, what should you select for file type?
      a. "Text File"
3. T/F You should always check the data types for correctness.
   A. True

Vertical Bar Chart
List the steps to make a vertical bar chart Employees by Employment Type.
1. Drag Employee Type to Row shelf
2. Drag Count to the Columns shelf
3. Label your Count by placing Count also on the Label Mark
4. Rename y-axis as "# Employees"
5. Title sheet as "Employment type"

Horizontal Bar
List the steps to make a horizontal bar chart Average Satisfaction Score by Start Date
1. Drag Start Date to the column shelf
2. T/F Tableau default to displaying year.
   A. True
3. Drag Satisfaction Score to the Row shelf.
4. Click on the downward arrow on SUM(Satisfaction Score) and change to AVG(Satisfaction Score)
5. T/F Tableau defaults to a line chart.
   A. True
6. How can you swap Line for Bar?
   A. Navigate to Marks Panel and select Line.

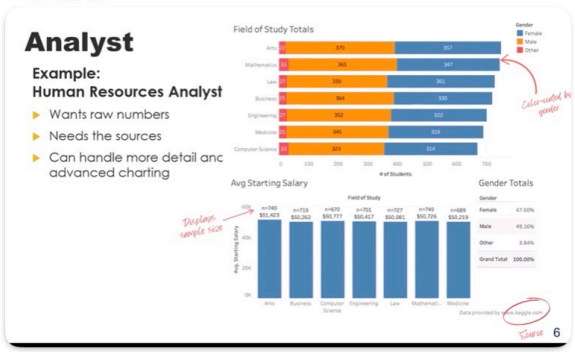
Understanding Bias In Data Visualization

1. How does bias in data visualization occur?
   A. intentionally or unintentionally distort, manipulate, or deceive viewers
2. What do biases lead to?
   A. leads viewers to misunderstand or misinterpret the information
3. How does bias occur?
   A. 1. scale manipulation, 2. cherry-picking data, 3. data omission, 4. misleading chart types, 5. personal internal bias
4. What does **scale manipulation** mean?
   A. altering the axis to exaggerate or minimize data differences
   B. Give an example of scale manipulation
      a. Starting the Y axis at a number other than 0.
   C. What does **cherry picking** data mean?
      a. Choosing data points or information that supports a desired conclusion, while ignoring or disregarding data that contradicts or challenges it

Resonate with your Audience

1. List the kinds of questions should you ask when you are designing your data visualizations.
   A. Who is going to be using this data?
   B. Do I have complete data from a trusted source?
   C. What decisions are going to be made based on this data?
   D. What level of data literacy does this audience have?
   E. Do they need context or are they already familiar with the topic?
   F. Is there any Personal Identificable (PII) or sensitive information?
   G. What questions are they likely to ask?
2. What are the four common audience types?
   A. Executives, Data Analysts, Area Specific, and General Public
   B. What do each of the four common audience types typically look for?
      a. Executives: quick summaries: prefers dashboard with summaries (One pager, key KPIs)
      b. Data Analyst: explore the data (prefers detailed filters and drill-downs)
      c. Area Specific (e.g. Marketing Manager): wants trends, customer segments, want visual storytelling with takeaways
      d. General public: needs simple language and prefers clear labeling and big-picture summaries

3. T/F Data analysts want raw, clear documentation of sources and the ability to explore in depth on their own.
   1. True
4. T/F Data analyst prefers advanced charting, filters, and drill-down capabilities.
   1. True



5. Find a way to add granularity to your visualizations and dimension to your data.
   1. You can add sample size e.g. n=749 or add dimension by color coding the gender based n the field of study.
6. Area specific roles (e.g. Marketing Manager)
7. For area of specific, what do you want to create?
   1. create a narrative (story telling), interesting find that help them take action, you can give them more text around to give context of what's going on.
8. For the general public, what do you want to create?
   1. Give options, no PII, provide sources, and give detailed consistent story

1. How can you add a filter so that people can see what they are interested in seeing?
   A. Graph > field of study > filters > "feature you want to filter by"> double click and move it
2. How can you apply the filter to all the worksheets in the dashboards (that are relevant)?
   A. Filter box > Apply to Worksheets > Selected Worksheets > check all the worksheets that would apply to the filter.
3. How can you use color to support deeper analysis?
   A. What is a way to analyze cross different dimensions?
   B. go to the sheet > drag "the dimension you want to further show" to color
      a. E.g. On the field of study total sheet, drag gender column to the color found in Marks

C. T/F Analyzing dimensions can reveal trends.
   a. True
D. How can you make sure that the color legend also appears in the dashboard?
   a. Downward triangle > legend > color legend
   b. How can you make the color legend appear more aesthetic?
      1. Color legend > triangle > floating > place it anywhere
E. T/F Adding text is great way to give context, highlight your story and give additional that could have been missed.
   a. True
F. How can you add text?
   a. Objects > Text > e.g. add your reference of where you got your data
G. T/F Calculated fields allow you to create new data points base on existing ones.
   a. True
H. How can you create a calculate field e.g. sample size?
   a. Desired sheet > data pane > triangle > create calculated field > name the result of the calculate field
   b. What is the formula for sample size?
      i) "n=" + STR(COUNT(Student ID))
      ii) What does COUNT(Student ID)) mean?
      counts the number of student records in your data
   c. How can we get the calculated field to show up?
      Drag it into the Label under Marks

Introducing to the Big Picture

1. T/F The tool tip allow you to have little pop up to highlight insight while also being clean and concise.
   a. True
2. T/F Design tools to be accessible for a lot of people e.g. user friendliness.
   a. True
3. How do you create tool tip?
   a. Sheet > Mark > Drag field to Tooltip
4. T/F Your dashboard should be user friendly for colorblind or for the case that your dashboard is printed in black and white.
   a. True