Practical 9

<u>Common Mistakes and Pitfalls in Data Visualization</u>
In today data-driven world, it is imperative to be have a centralized, standardized, and high-quality source of data. But having good data isn't enough on its own. To unlock the true value of your data, you need to be able to analyze and interpret it effectively to enable timely and accurate decisions. That's where data visualization comes into play.

However, common mistakes and pitfalls can easily undermine the effectiveness of data visualization. To be fair, misleading visualizations aren't always the byproduct of bad intentions, but even honest mistakes misinform viewers. Eyes are impressionable, and humans tend to gloss over information in search of quick takeaways. Sight and cognition must be a key consideration in the design of all data visualizations.

<u>Lab Task</u>
Discuss common mistakes and pitfalls of data visualization and fill in the following table with 10 points (at least) which include ways to avoid those mistakes and pitfalls.

	Mistakes / Pitfalls	Description	Example	Way to Avoid
1	Overcomplicating visuals	When creating data visualizations, it can be tempting to include as much information as possible to make them as valuable as possible. However, adding too many visuals on one dashboard or too many metrics on one visual can have the opposite of the intended effect — making the data confusing and more difficult to understand and analyze.	Imagine trying to compare performance across dimensions like impressions, engagements, clicks, conversions, and revenue, all within a single chart. It wouldn't be easy to arrive at meaningful insights as your attention would be split rather than being focused on analyzing trends for key metrics.	A better approach is simplifying visualizations to include only charts and visuals tailored to the most relevant KPIs for the key business objectives. This approach provides clarity for decision-makers and makes it easier to spot optimization opportunities and identify any issues to be addressed..
2	Overusing animations or interactivity	Excessive animations or complex interactive features can distract users or make the visualization harder to interpret, especially for static presentations.	Excessive animations with complex interactive features can distract users slow down the visualization frustrate users trying to focus on static insights presentations.	A dashboard with complex transitions or excessive animations can distract and make analysis harder. Test with real users to gauge the right complexity, visualization's complexity, and focus to their needs, ensuring it's neither too technical too basic.

Inconsistent Time Intervals	When visualizing time-series data inconsistent time intervals(mixing weeks, months, quaters) can lead to confusion and inaccurate interpretation. It can break the rythm of the trend and may cause spikes and dips that are simply artifacts of uneven time grouping	A chart tracking user sign-ups might show daily data for January, switch to weekly in february and monthly in March-without noting the change. This could falsely suggest a dropb in activity	A chart tracking user sign-ups might show daily data for January, switch to weekly in february and monthly in March-without noting the change. This could falsely suggest a dropb in activity
Static chart with no interactivity for complex data	Static chart can limit the understanding when used to present complex data as they don't allow the users to explore, filter or drill down into specific details. Without interactivity, important insights may be missed and user might struggle to interpret large volumes of information at once.	Static chart can limit the understanding when used to present complex data as they don't allow the users to explore, filter or drill down into specific details. Without interactivity, important insights may be missed and user might struggle to interpret large volumes of information at once.	Incorporate interactivity through features such as filters, tooltips on hover and highlight actions. Filters allow users to focus on specific subset of data, tooltips provide detailed information without cluttering the view, and highlight actions help to trace the related data points across multiple charts.
Aesthetics over Function	When creating a graph, one may want to make it look as appealing as possible, however, this might come with the cost of the interpretability. As extra info clutters the graph, some visualizers might sacrifice literacy for their design. If the author leans into the feelings of the viewer without taking into account the literacy of the graph, they might end up with strokes of color and not a visual with readable info.	A flashy flowing graph with shapes and multiple colors.. but no legend and no numbers to convey their meaning. It may have some info, but the explanation might be too little or not enough context that aligns with the designs intuitively.	Focus on the message to convey first, then the aesthetics second. It is recommended to target the editorial thinking as it would help set the boundaries of what is there to be said and can not be compromised. Overall, weigh clarity and representation higher in terms of goals.

	Failure to Refresh Data Visualizations for Relevance	One of the common yet overlooked mistakes is to continue using outdated data in dashboards or visualizations. No matter the flawless visual design, outdated data may mislead decision-makers or reflect poorly on data credibility. This happens when visualizations are not dynamically tied to updated data sources or not checked regularly.	A sales chart for a month still reflecting March numbers while the team is now in July. The image might reflect improved performance, but in reality, up-to-date trends could have changed significantly. Stakeholders might base decisions on outdated information.	Always ensure your data sources are live or are refreshed at regular frequencies. For static reports or slides graphics, state the data time span. Set review schedules at regular frequencies to update visuals, and use version control or timestamp markers to show data was last updated.
	too much text or too many graph in 1 page because can cause confusion	long description and many chart make it hard to understand it in one slides	for example 1 slides have 2 to 3 graph this can make user to confuse and user might not understand what you saying	make it to different slides and change it to point form when present it
	Ambiguous Titles and Labels	Sometimes, the title or labels may be too technical or too generic that the audience have a hard time intepreting the message of understanding the graph, which reduces the efficiency of visualization.	For instance, a graph titled 'Performance Comparison' does not have clear definitions of the axis labels, but just a general 'Rate' axis. Users This leaves users with confusion in interpreting which performance or rate in included in the visualization for comparison, leaving a chance for misinterpretation with intuitive guesses of the chart's meaning.	Include specific and precise descriptions titles that reflect the graph's key messages. The axes should also be labeled with the measurement units or timeframes where necessary to improve clarity and reduce ambiguity.
	Poor Color Choices	When the chart wants to show several categories with color, sometimes we may use color schemes that are difficult to distinguish with each categories due to similar color shades, insufficient contrast between	When doing a stacked bar chart, there are two categories that needs to be distinguish to compare them. It would be hard to compare if two of the categories has same green color. The viewer may not be able to see the difference	A better way to do the comparision of the two component have distinct color schemes to avoid confusion and helps the viewer to get an rough insight on the visuals.

		elements and backgrounds and jarring color schmes. This makes the visuals extremely difficult to view and differentiatate the categories if the creator has selected poor color to visualize the data.	especially if there are a lot of categories.	
	Cherry picking data	This is a practice where the data visualiser selectively chooses the timeframe, data points and categories that supports the narrative or bias that they want to show while ignoring the data that contradicts this in the same dataset. This shows an incomplete picture of the reality and provides a biased/inaccurate understanding to the audience	A business/company presents a chart showing their steady growth of profits from 2020 to 2025 but omits the data from a several months of 2023 where the was a sharp decline of profits. This visual gives a wrong perception of uninterrupted profit streams. This deceptive practice is to get raise capital from new investors in the Series A pitching round	Always include the relevant dataset and clearly justify if any timeframes or data points are excluded for a any specific reasons. Be transparent and practice integrity in the information you convey through the visualisation. Include footnotes or annotations as needed Ensure to present a balanced insight (well-referenced), not just what supports your point