This is a graded discussion: **10 points possible**

due -

24 29

What data types? Why?

We are visualizing **data**.

1. So, what **types of data** are out there? For instance, does every dataset contain numerical data? If not, what are the other data types? Have you thought about **how to classify these data types**? If you haven't, now is the chance. :) What would be a good classification system if you have data visualization in mind? Again, do not blindly copy & paste from somewhere else. You should think about it by yourself first.

2. Then think about why would it be useful to understand data types when creating visualizations, and share your thoughts.

I think it may be useful to see concrete examples of datasets. For instance, the data you can obtain from Twitter (**https://dev.twitter.com/overview/api/tweets** (https://dev.twitter.com/overview/api/tweets) or **https://dev.twitter.com/overview/api/users** (https://dev.twitter.com/overview/api/users)) represents many interesting data types. You can also look at any other complex datasets, then ponder. 🤔

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Reply

Prem Amal (https://iu.instructure.com/courses/2165942/users/6684842)

Monday

There are many different datatypes available and every dataset may not contain numeric data only. These data types encompass numerical data, both continuous and discrete, categorical data with nominal and ordinal attributes, text data that can be unstructured or structured,

temporal data indicating dates and times, geospatial data with coordinates, binary data offering yes/no choices, hierarchical data arranged in tree structures, network data representing relationships, and audio and visual data, including music, images, videos. Recognizing these data types is crucial when designing visualizations because it guides the selection of appropriate visualization techniques, ensuring that data is accurately visualized. Understanding data types is fundamental for effective data visualization. Data comes in various types, and a well-thought-out classification system helps categorize and work with it. Numeric data can be visualized using bar charts, line charts, or scatter plots. Text data can be visualized using word clouds or textual representations. Geospatial data can be displayed on maps or heat maps. It is necessary to understand datatypes because different data types require different chart types for effective representation. It helps prevent errors caused by incorrect data types. Proper data type usage reduces confusion.

Reply

Gary Croke (https://iu.instructure.com/courses/2165942/users/6706306)

Monday

I think this question goes to the definition of data. Non-numeric data must be categorical in some sense, if it is to be considered data. That is, a set of data must relate in some way. It should have a domain, or finite range of possible values. A lot of non-numeric data is lexical, but being in the form of words alone doesn't make it data (any more than a number isn't data, unless it has some context associated).

Some non-numeric data is easy to classify (e.g. car make and model), some less so (Twitter message contents). Some visualization techniques may pair naturally with categorical data (tables, histograms, bar graphs). Some categorical data may need significant processing to allow sensible presentation in graphical form. If visualizing non-numeric data presents some challenges, it also presents opportunity to being creative and thoughtful in design.

Reply

Dustin Cole (https://iu.instructure.com/courses/2165942/users/6701715)

Monday

1. There are many different types of data, and it is not always numerical. Other types include:

- Categorical Data: Data that can be categorized. An example would be Blue, Black, Green.

- Continuous Data: Data that has an infinite number of values, like time series data. An example would be 2/25/2009 10:32:3406123043294.
- Numerical or Integer Data: Data that is numeric but does not have infinite number of values, like full years of age. An example would be 21, 13, 27, 97.

Categorical would probably work best with bar charts, pie charts. Continuous is best with probability or time-series line charts, or area charts. Numerical works with bar charts, scatter plots, box plots etc.

2. It is helpful to understand data types because then you can figure out how to best display those data types so that other people understand what they are looking at. It helps the analyst or data scientist pick the correct chart and tell the story of the data in the most useful way.

Reply

Sydney Dicks (https://iu.instructure.com/courses/2165942/users/6819877)

Monday

1. I wouldn't think all types of data start out as numerical data, but before using a computer to visualize the data it would have to be numerically encoded to enable it to be visualized. Prior to this encoding though, I think the following data types exist: numerical data (sums, counts, averages, etc.), location data, text data, and image data. Thinking back to the last module, considering the context of the data may be important too, such as data to be used for scientific purposes versus news or other non-scientific publications. Location data might go well with map-like visualizations, numerical data may be better suited for charts and graphs. Text and image data may be good with infographic-type visualizations.

2. Some visualizations might be better to represent one type of data versus another. A simple example: word clouds might better represent text data versus a bar chart since it uses text in its visualization. The way a visualization encodes the data depends on what that data is about.

Reply

Sneha Satish (https://iu.instructure.com/courses/2165942/users/6679606)

Monday

The data types that I have worked with are as follows:

- Qualitative/Categorical data which is best represented with bar/pie charts:

    - Nominal (natural order of ranking)
    - Ordinal data(clear order of ranking).
- Quantitative/Numerical data which is best represented with histograms/scatter plots:
    - Discrete (whole numbers with a finite range)
    - Continuous (real numbers with an infinite range) data.
- Text data which is best represented by wordclouds:
    - Structured: Organized in a structured format
    - Unstructured: Completely unorganized
- Geospatial data which is best represented with heatmaps.
- Time series data which is best represented with line charts

Based on the data, appropriate visualization techniques need to be chosen that can only happen once you understand what type of data you're dealing with. This ensures accurate analysis, visual clarity, discovering insights, and efficient storytelling. Using inappropriate visualizations for given data types can lead to misleading visualizations. Hence, it is important to understand the data types when creating visualizations.

Reply

Thomas Jablenski (https://iu.instructure.com/courses/2165942/users/6701599)

Monday

Not every dataset contains numerical data only. There are other ways that data can be represented that isn't just integers. Some examples of this include booleans, strings, and characters. Although these are easier for people to pick up on these values can be changed to be represented in a numerical sense. Booleans are easy as we can represent false with 0 and true with 1. Characters and strings can be converted into binary which is also another variant of showing the same data but in a different format and in this case numerical.

I would think that being able to understand what different data types are would help contrust your visualizations better. Having the ability to know whether your data is continuous vs. discrete or a measure vs. a dimension could give you some intuition as to what visualizations to choose in the first place. For example, a scatterplot works well with 2 dimensions which give numerical values opposed to trying to fit a scatterplot with categorical data on both axes. It doesn't work well and we'd defer to a different chart type.

Reply

Trevor Speich (https://iu.instructure.com/courses/2165942/users/6704497)

Monday

1. In terms of working with data, I have only worked with survey data which is primarily numerical but is also commonly categorical. Categorical data is a dataset where there are a fixed number of options. For instance, when you select gender, the options are usually male, female, or other. These three choices make up the categorical dataset of gender for that survey question. To process this categorical data through into a data visualization or to be worked with through an equation it is commonly turned into dummy variables which then become another data type of Boolean. So, for gender, it would break out into three columns, one representing when the value is true for that dummy variable, becoming a type of matrix. One could also have a datatype that is only string values but that would only truly be useful if one were doing a form of sentiment analysis on the text and through that sentiment analysis, they would create a data visualization once numerical information was obtained. A subtype of numerical data would be time series data and or point-in-time data.
2. Each data type has a data visualization that lends its hand better. Though to visualize categorical it must some degree be viewed as a Boolean, categorical data is naturally grouped. Through this natural grouping data visualizations like that of bar charts or even the dreaded pie charts tend to lend themselves well to categorical data. Even for string only, once a sentiment analysis is done and now you only have numerical values charts like word clouds or even heatmaps lead themselves better than a traditional positive x-y plot. It is useful to understand your data and data types as they can help to be a guide towards what visualization may suit my data best. If one has time-based data and they try to make a pie chart they may not be communicating their data fully.

Reply

Sarah Biggs (https://iu.instructure.com/courses/2165942/users/5667580)

Tuesday

1. From my understanding, the easiest way to classify data is, first, by deciding if it is quantitative or categorical. Quantitative is numerical by nature: from a quantifiable variable. For example, frequency of a particular variable is quantitative. Notably, quantitative data could further be broken down by the following categories: discrete and continuous. The frequency example I previously gave can often describe what discrete data look like: e.g. the amount of people in an office who choose to drive, bike, walk, or take public transport to work each week. The results may look something like 5 people drive to work, 1 person walks, 3 people ride their bikes, and 4 people take public transport. It would not be 1.5 people do a certain activity.

Notably, if this data were presented in the form of a percentage or proportion, those data could be continuous.

However, this does not mean that categorical data cannot appear as a number. Another way of saying categorical data is qualitative. You're describing the variable as a quality or category rather than a quantity. E.g. with the "iris" vega dataset, you can describe each iris by the species it is as well. This variable is a quality/category rather than a quantity. Instead of using a word to describe the species, you could categorize it as species 1, 2, 3... Thus, categorical data can also be broken down into two further categories: nominal (e.g. species name) and ordered (species number or letter or another category that has a proper order, like day of the week).

2. I think it is worth understanding data type when considering how to visualize the data because there are certain charts that lend themselves better to different types of data. E.g. a time-series, a categorical data type ordered by year (or another time interval), of average engagement scores for a specific employer, a quantitative data type, often looks nice on a line chart, allowing for easy comparisons year over year. Frequency data organized by categories (e.g. how many pets each person in a cafe has) can be easily understood through a bar chart.

Reply

Onur Tekiner (https://iu.instructure.com/courses/2165942/users/6758180)

Tuesday

Many data types include string, integer, float, and boolean. There is no need for data to have numerical columns.

For example, the data could contain just the name and last names of the class. But still, indexing rows with numbers is better for tracking.

A good classification system uses every useful and beneficiary feature to predict the target variable with the highest accuracy. I like to use a confusion matrix with a heat map for visualization. It is nice to see every detail about our model.

Reply

Andrea Chung (https://iu.instructure.com/courses/2165942/users/6443321)

Tuesday

Generally, the data types can be categorized into two types: quantitative and qualitative. For quantitative data, the type of data we encounter is all numerical. However, for qualitative data, we see mostly textual data. Easiest and simplest approach in classifying these data types is by whether it is numerical or non-numerical data. It is important to classify the types in order to create effective data visualization. For example, for quantitative data, it would be more efficient to utilize scatter-plot or histogram. However, for qualitative data, it would be more helpful if bar chart is used. Also, there are special types of data visualization such as network data or text data. For network data, network graphs can depict in most plausible way. It is important to understand the data types when creating visualization. It not only helps the readers to understand better but also supports researchers to easily grasp the analysis behind the data and give further outputs.

Reply

Erik Gonzalez (https://iu.instructure.com/courses/2165942/users/6352173)

Tuesday

1. There are various data types out there. Off the top of my head, I can think of a couple of different ones:

- Categorical
- Qualitative
- Spatial
- Temporal

A good classification system in regard to data visualization may be something that takes into account how best differences and similarities within each data type can be conveyed. For example, categorical data may best be displayed as groups, qualitative data may have an ordering that helps convey information, spatial data may require a map, and temporal data may necessitate the use of a calendar or clock.

2. Understanding data types allows for better planning prior to developing a visualization, while also allowing some common ground between the designer and the audience around how data should best be understood when looking at a visual.

Reply

Ao Zhang (https://iu.instructure.com/courses/2165942/users/6703098)

Tuesday

Based on my understanding, there are 2 main types of data, continuous data and categorical data. Moreover, there are also some subgroups in categorical data like binary data and ordinal data. The way to classify these data types is checking their definitions. For example, blood pressure and heart rate are always considered as continuous data since they stand for the specific numbers. By contrast, gender and race are always treated as categorical variables. However, I did not think about system about it. It looks like I need to learn something more from this class.

Understanding data types is crucial when creating data visualizations since we need to adapt a more fitting way to show data properly. For example, categorical data might be best represented with bar charts, while continuous data might be better suited for line graphs or scatter plots. Moreover, some visualizations might require data transformations. Knowing the data type can guide these transformations. For example, logarithmic transformations are often applied to certain continuous data types to better visualize data with wide-ranging values.

Reply

Sangzun Park (https://iu.instructure.com/courses/2165942/users/6703376)

Thursday

1. Recently, there is a strong tendency to classify data structures into structured and unstructured types. And this structure is again classified into discrete and continuous. For example, digital images are unstructured, and sales records are structured. At the same time, digital images are discrete, and sales records are continuous.

2. The reason this is important to understand is, I think, first of all, because each piece of data requires different techniques to visualize the data. For example, in the case of coding, different grammars must be used. Another reason is that visual techniques for visualizing data are different. That's why I think it's important to first understand the data.

Reply

Shruthi Senthilmani (https://iu.instructure.com/courses/2165942/users/6688148)

Thursday

1. There are many types of data including, numerical and categorical data, binary data, text data, image data, audio data, geospatial data, time series data, etc. Every dataset need not necessarily contain numerical data, but any form of data is generally converted into numerical data for ease of analysis and visualization(conversion of categorical data to numerical in label encoding, etc.). One way to classify these data types is to classify them based on their well-defined structure and how much pre-processing they might require- Structured and unstructured data types. Structured data can include Numerical data, binary data, and time series data which is typically easy to query, process, and analyze and requires less pre-processing. Unstructured data includes categorical data, image data, and audio data which may require pre-processing before analyzing or visualizing such data.

2. It is important to understand the data types before visualizing them as different data type requires different types of visualizing techniques. This way we can pre-process the data in hand to make it appropriate for visualizations. For example, we use scatter plots for visualizing numerical data but for categorical data, we pre-process it (encoding) to numerical to make the scatter plot. This step of understanding the data, whether it is categorical or numerical is crucial to work on appropriate visualizations.

Reply

Akash Patil (https://iu.instructure.com/courses/2165942/users/6699404)

Thursday

There are definitely many types of data out there. There is numerical data, categorical data, image data, audio data, text data, etc. The datasets can be divided into groups of how much pre-processing they need. For example, numerical data can be plotted easily but text data and categorical data need further preprocessing before we can visualize them or find relationships between their features.

Understanding data types can give us a heads up on what kind of libraries we need for plotting our data for example image data uses different commands to plot than numerical data. Hence we can be prepared with the necessary preprocessing required for the current data to create visualizations. It also helps us create appropriate visualizations for example word clouds for text data.

Reply

Olufisola Oladipo (https://iu.instructure.com/courses/2165942/users/6469527)

Thursday

Data types are attributes associated with a piece of data that tells a computer how to interpret its value. There are many data types. Some are generic computer data types, while others data types are defined by the creator in a particular format for their own record purposes.

The following are common data types:

1. Integer

2. Floating point

3. Character

4. String

5. Boolean

6. Array

7. Date

8. Enumerated type

9. Date

10. Time

11. Datetime

12. Timestamp

Other data types as defined by the creator are for example, Twitter data types - object, array of strings, int64, string, boolean

Data types are important in data visualization for intended interpretation of consistent and clean data. The data is collected in a consistent manner with expected value. Consistent data with expected value enables ease of analysis and activating of the data and by extension data visualization.

Reply

Harsh Patel (*he/him/his*) (https://iu.instructure.com/courses/2165942/users/6825193)

Yesterday

Data types can be classified into various types based on its characteristics. Not all dataset contain numerical data. The types are as follows;

- Numerical dataset: It consists of numerical values that can be divided into discrete adn continuous values. If dataset contains numbers, it can be classified in this category.
- String or text dataset: This category of data contain unstructured text information.
- Binary dataset: It contain only binary value that are 0 and 1.
- Video and image dataset: This category consist of visual information such as images and videos.
- Audio dataset: It consists of audio information that can be used in speech recognition, music analysis, and audio processing.
- Categorical Data: Categorical data represents distinct categories or labels and is often used to group and classify items. Examples include gender, colors, or product categories.

Reply

Mukul Gharpure (https://iu.instructure.com/courses/2165942/users/6678592)

Yesterday

Not every dataset solely contains numerical data; they can also include categorical, ordinal, and nominal data types. Classifying these types is crucial for data visualization, as it guides the selection of appropriate visualization techniques and aids in accurately representing the data's nature and relationships. For instance, numerical data can be visualized using scatter plots, while categorical data may be better represented by bar charts. Understanding data types is essential as it influences the encoding and perceptual interpretation of the information, ensuring the visualization is effective and meaningful. Examining complex datasets, such as those from Twitter, reveals a variety of data types, underscoring the importance of thoughtful consideration and classification for successful visualization.

Reply

Renu Jaiswal (https://iu.instructure.com/courses/2165942/users/6704404)

Yesterday

There are various data types some of them are **numerical data** like age, height, and price, **categorial data** consists of different categories or labels like yes/no, male/female, **geospatial data** consists of geographical information like latitude longitude, **text data** like content of music/poem, chats, conversation etc.

Understanding data type is crucial for choosing the right visualization and rendering information correctly.

Reply

Carmen Galgano (https://iu.instructure.com/courses/2165942/users/6762945)

Yesterday

Most datasets include numerical data, but there can also be descriptive data such as different categories along with time, geographic, and text data.

I would say ways to classify data is

Numerical - numbers that can have functions performed on them and quantify something

Text - could be a color or an Id number that describes something

Time - This should be a timestamp

geographic - this could be coordinates or states or countries

I think it could be helpful to understand different data types when creating visualizations because some chart types may work better with certain data types. For example using a line chart for data that has a numerical field and a time field works well.

Reply

Alan Varkey (https://iu.instructure.com/courses/2165942/users/6681532)

Yesterday

1. There's a wide variety of data types beyond just numerical data. Understanding these data types is crucial when it comes to data visualization. Let's explore some of the common data types:

   a. **Numerical Data**: This includes quantitative data that can be measured and expressed in numbers. Examples include temperature, age, and income.

b. **Categorical Data**: This type of data represents categories or labels. It doesn't have a natural numerical value associated with it. Examples are colors, gender, and product categories.

c. **Ordinal Data**: Ordinal data is categorical data with a specific order or ranking. For instance, education levels like "high school," "bachelor's," "master's," etc.

d. **Time Series Data**: Time-based data with timestamps, often used for trends and patterns analysis. Examples include stock prices, weather data, and website traffic over time.

e. **Text Data**: Textual information, such as tweets, articles, or reviews. This data can be processed for sentiment analysis and natural language understanding.

f. **Geospatial Data**: Data associated with geographical locations, like longitude and latitude coordinates. It's essential for mapping and spatial analysis.

To classify these data types for data visualization, we could categorize them into dimensions like "Quantitative," "Categorical," "Temporal," and "Spatial." This classification helps us choose appropriate visualization techniques based on the data's nature.

2. Understanding data types is crucial for creating effective visualizations. Here's why:

a. **Choosing the Right Visualization**: Different data types require different visualization techniques. For example, bar charts are excellent for displaying categorical data, while line charts work well for time series data. By knowing the data type, we can select the most suitable visualization, which enhances the viewer's understanding.

b. **Enhancing Interpretation**: The choice of visualization can make patterns and insights in the data more apparent. Misrepresenting data types with inappropriate visualizations can lead to misunderstandings or misinterpretations.

c. **Effective Communication**: Visualizations are a powerful tool for conveying information. Understanding data types helps us design visualizations that tell a clear and compelling story, making it easier for stakeholders to grasp insights and make informed decisions.

When it comes to Twitter data, you're absolutely right. Twitter API data encompasses various data types, such as text (tweets), numerical (follower counts), and temporal (timestamp of tweets). Analyzing and visualizing such data can provide valuable insights into social trends, sentiment analysis, and user engagement.

Reply

Hymavathi Gummudala (https://iu.instructure.com/courses/2165942/users/6679250)

Yesterday

1. The data can be structured or unstructured data. The dataset can contain images, text, and numerical data.

if it's a mixture of all types of data then we will classify images based on the dimensions as it is dimensional data and regex operations or if it's of alphabets or alphanumeric then text data and whichever are numbers will go under numerical data.

Temporal data, Geospatial data, and Network data are other data types.

if it's text categorical data- if it's of some fruits or vegetables (Categorize it into one category and color it)

images as they are already colorful or maybe in greyscale I don't think so we need to visualize again

for numerical data whatever I learned so far.

Things to keep in mind for a good classification system:

Line charts for time series data

bar charts for categorical data (ranking)

2. We cannot consider pie charts when there are too many categories.

A line chart would be better for time series data not some other.

Reply

Yumeng Liang (https://iu.instructure.com/courses/2165942/users/6587577)

Yesterday

Not all dataset has numerical data. For example, the learning system from a university does not only have numerical data, it also has personal information in it. I think the data types can be classified as numerical data, image data, text data...

It is important to understand data types because when you have to create a data set, you have to think about how to integrate all the data together. It affects how you build your data

structure.

Reply

Aditya Sanjay Mhaske (https://iu.instructure.com/courses/2165942/users/6692144)

Yesterday

Types of Data:
Data can be categorized into several types

- Numerical Data
- Categorical Data
- Text Data
- Time Series Data
- Geospatial Data
- Binary Data
- Hierarchical Data

Understanding data types in visualization:

Different data types demand specific visualizations. For example, bar charts suit categorical data, while line charts are ideal for time series.

Data type knowledge aids in accurate interpretation. When visualizing numbers, scales, and labels should reflect their numeric nature.

Understanding data types enables crafting visuals that convey insights effectively, such as highlighting trends in time series or comparing categories in categorical data.

Reply

Simon Driver (https://iu.instructure.com/courses/2165942/users/6818242)

9:56am

1. I definitely think there more types of data out there than just numerical data, and lots of datasets do not even contain numerical data type. I would say that there is also categorical data, where data fits into a certain group or type, and that is how we classify it. There is also plenty of data which is based off of text; surveys, interviews, feedback -- all of these produce textual data which can't be quantified numerically (i.e. they are qualitative data).

I think some things to think about for visualizations with regards to data set are: is the data discrete or continuous? Is the data numerical or categorical? Do the actual values for each data point matter, or we need to focus on the number of data points with the same values, or above/below a certain threshold, and so forth.

2. I think before blindly going in and making a visualization, we really do have to understand the type of data we are working with. For instance, if we have qualitative data, probably don't want to make some sort of visual that charts the frequency of ever word; that would be useful. However, if we have numerical data showing the number of flights delayed at an airport every day, having a histogram to show frequency would be great. Although we may find interesting patterns or visuals down the road, I think it is important to at least begin the visualization process with a good understanding of the data type and a matching method of visualization.

Reply

Madhuri Patibandla (*she/her/hers*) (https://iu.instructure.com/courses/2165942/users/6760559)

12:32pm

Every dataset doesn't contain numerical data, we can consider String or time data types as a categorical and based on the time/date/year we can develop a bar chart.
if the data comes as a string,CLOB it is considered as categorical
and if the data comes as a Numbers it is considered as a Numerical data types.
if data comes as a time, date is considrded as datetime datatype,
For year considered as a string. to store multiple line in a column then considered as a COLB Data type.
per my understanding, Bar and Line charts are the good data visualization techniques.

Reply

Shreedeep Sadasivan Nair (*he/him/his*) (https://iu.instructure.com/courses/2165942/users/6813278)

12:54pm

1) There are categorical data types and continuous data types , categorical data types have string and object and continuous data types have integer and float data types,.

2) It is useful to understand different data types in order to create an appropriate visualization because if we have a categorical data type we look to use something like a countplot where

as with continuous data type you often want to use something like a scatterplot , distplot or histogram

Reply

Robert Perez (*he/him/his*) (https://iu.instructure.com/courses/2165942/users/6701521)

3:15pm

Data types fit into two broad categories, continuous and discrete. Continuous data types are numeric values that can vary widely and have specific precision to a number of decimal places. Discrete values can be either numeric or alphanumeric, and they are most often used as categorical labels for data. There are further segments within these two broad categories. For example, in data science, one of the most common use cases is binary classification. In these cases, the label is a discrete categorical variable generally represented by a Boolean true or false.

The most important consideration in regards to data visualization when dealing with data types is how to represent the data meaningfully in the visualization. With continuous variables, we have to consider scale. For example, if you were creating a graph of home values compared to square footage, the numbers are going to have very different scales -- generally hundreds of thousands for the value and hundreds to thousands for square footage, a difference of hundreds of times.

When working with other types of data, like astronomical data, scales can be even more different, like distance in kilometers and luminosity. With categorical variables, it is important to group or bin the variables meaningfully. Too often, creators simply have too many categories or bins on their visualizations. It is important with categorical variables to know what the most significant categories are and have a "catch-all" for the remainder so as not to overwhelm the viewer with too many series plotted.

Reply

Jash Shah (https://iu.instructure.com/courses/2165942/users/6684840)

3:25pm

Types of Data: Data can be of different types. It's not just numbers. There are four types:

- **Numerical Data:** This is all about numbers. Like how many likes on a post or the temperature.
- **Categorical Data:** This is like labels or categories. For example, types of fruits - apples, bananas, and oranges.
- **Ordinal Data:** It's a bit like categorical but has a specific order. Like star ratings - 1 star, 2 stars, 3 stars, etc.
- **Text Data:** These are the words and sentences we use, like Twitter posts or comments.

Selecting the right type of data for our charting purposes is very important.

Examples: Let's say we're looking at Twitter data:

- **Numerical Data:** You can count how many retweets or likes a tweet got.
- **Categorical Data:** You can categorize tweets into topics like sports, politics, or entertainment.
- **Ordinal Data:** You can use star ratings to rate tweets - 1 star for bad, 5 stars for excellent.
- **Text Data:** The actual text of the tweets is text data.

Reply