Week I

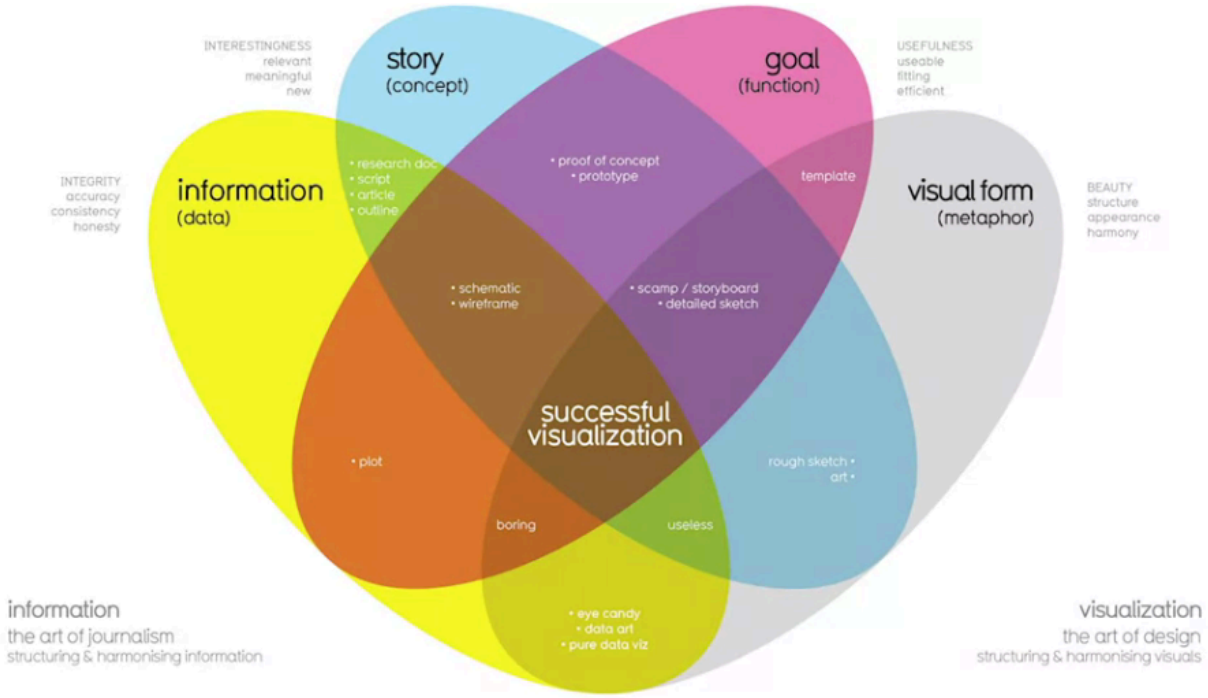
Why data visualization matters

Data visualization ✧.*
The graphic representation and presentation of data.

1. Looking at visuals in order to understand and draw conclusions about the data.
2. Creating visuals using raw data to tell a story.

Rule for creating visualization

1. Your audience should know exactly what they're looking at within the first five seconds of seeing it.
2. What we have to do to create a visualization that's: *understandable*, *effective* and, most importantly, *convincing*.



Effective data visualizations

A data visualization, sometimes referred to as a “data viz,” allows analysts to properly interpret data. A good way to think of data visualization is that it can be the difference between utter confusion and really grasping an issue. Creating effective data visualizations is a complex task;

there is a lot of advice out there, and it can be difficult to grasp it all. In this reading, you are going to learn some tips and tricks for creating effective data visualizations. First, you'll review two frameworks that are useful for thinking about how you can organize the information in your visualization. Second, you'll explore pre-attentive attributes and how they can be used to affect the way people think about your visualizations. From there, you'll do a quick review of the design principles that you should keep in mind when creating your visualization. You will end the reading by reviewing some practices that you can use to avoid creating misleading or inaccurate visualizations.

Frameworks for organizing your thoughts about visualization

Frameworks can help you organize your thoughts about data visualization and give you a useful checklist to reference. Here are two frameworks that may be useful for you as you create your own data viz:

1) The McCandless Method

You learned about the David McCandless method in the first lesson on effective data visualizations, but as a refresher, the McCandless Method lists four elements of good data visualization:

1. **Information**: the data you are working with
2. **Story**: a clear and compelling narrative or concept
3. **Goal**: a specific objective or function for the visual
4. **Visual form**: an effective use of metaphor or visual expression

Note: One useful way of approaching this framework is to notice the parts of the graphic where there is incomplete overlap between all four elements. For example, visual form without a goal, story, or data could be a sketch or even art. Data plus visual form without a goal or function is eye candy. Data with a goal but no story or visual form is boring. All four elements need to be at work to create an effective visual.

2) Kaiser Fung's Junk Charts Trifecta Checkup

This approach is a useful set of questions that can help consumers of data visualization critique what they are consuming and determine how effective it is. The Checkup has three questions:

1. What is the practical question?
2. What does the data say?
3. What does the visual say?

Note: This checklist helps you think about your data viz from the perspective of your audience and decide if your visual is communicating your data effectively to them or not. In addition to these frameworks, there are some other building blocks that can help you construct your data visualizations.

Pre-attentive attributes: marks and channels

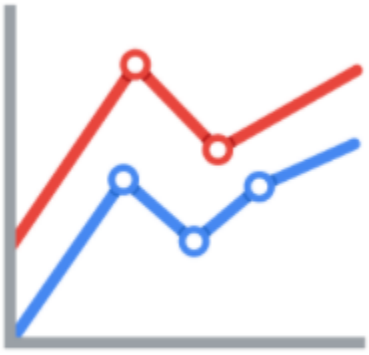
Creating effective visuals means leveraging what we know about how the brain works, and then using specific visual elements to communicate the information effectively. **Pre-attentive attributes** are the elements of a data visualization that people recognize automatically without

conscious effort. The essential, basic building blocks that make visuals immediately understandable are called marks and channels.

Marks

Marks are basic visual objects like points, lines, and shapes. Every mark can be broken down into four qualities:

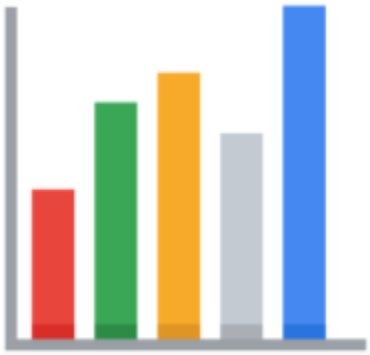
1. **Position** - Where a specific mark is in space in relation to a scale or to other marks



2. **Size** - How big, small, long, or tall a mark is

3. **Shape** - Whether a specific object is given a shape that communicates something about it

4. **Color** - What color the mark is

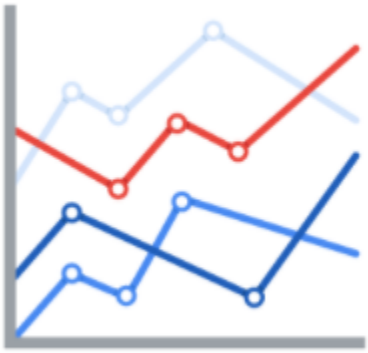


Channels

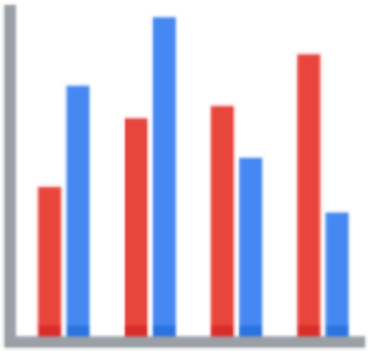
Channels are visual aspects or variables that represent characteristics of the data. Channels are basically marks that have been used to visualize data. Channels will vary in terms of how effective they are at communicating data based on three elements:

1. **Accuracy** - Are the channels helpful in accurately estimating the values being represented? For example, color is very accurate when communicating categorical differences, like apples and oranges. But it is much less effective when distinguishing quantitative data like 5 from 5.5.

2. **Popout** - How easy is it to distinguish certain values from others?
There are many ways of drawing attention to specific parts of a visual, and many of them leverage pre-attentive attributes like line length, size, line width, shape, enclosure, hue, and intensity.



3. **Grouping** - How good is a channel at communicating groups that exist in the data? Consider the proximity, similarity, enclosure, connectedness, and continuity of the channel.



But, remember: the more you emphasize different things, the less that emphasis counts. The more you emphasize one single thing, the more that counts.

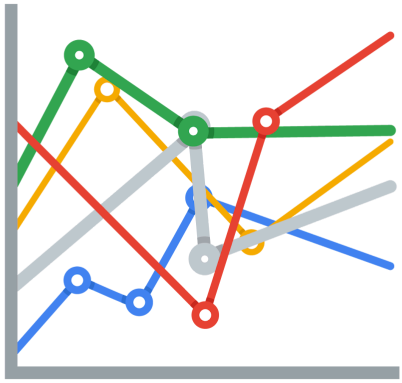
Design principles

Once you understand the pre-attentive attributes of data visualization, you can go on to design principles for creating effective visuals. These design principles are important to your work as a data analyst because they help you make sure that you are creating visualizations that communicate your data effectively to your audience. By keeping these rules in mind, you can plan and evaluate your data visualizations to decide if they are working for you and your goals. And, if they aren't, you can adjust them!

Principle	**Description**
Choose the right visual	One of the first things you have to decide is which visual will be the most effective for your audience. Sometimes, a simple table is the best visualization. Other times, you need a more complex visualization to illustrate your point.
Optimize the data-ink ratio	The data-ink entails focusing on the part of the visual that is essential to understanding the point of the chart. Try to minimize non-data ink like boxes around legends or shadows to optimize the data-ink ratio.
Use orientation effectively	Make sure the written components of the visual, like the labels on a bar chart, are easy to read. You can change the orientation of your visual to make it easier to read and understand.

Color	There are a lot of important considerations when thinking about using color in your visuals. These include using color consciously and meaningfully, staying consistent throughout your visuals, being considerate of what colors mean to different people, and using inclusive color scales that make sense for everyone viewing them.
Numbers of things	Think about how many elements you include in any visual. If your visualization uses lines, try to plot five or fewer. If that isn't possible, use color or hue to emphasize important lines. Also, when using visuals like pie charts, try to keep the number of segments to less than seven since too many elements can be distracting.

Avoiding misleading or deceptive charts



As you are considering what kind of visualization to create and how to design it, you will want to be sure that you are not creating misleading or deceptive charts. As you have been learning, data analysis provides people with insights and knowledge they can use to make decisions. So, it is important that the visualizations you create are communicating your data accurately and truthfully. Here are some common errors to avoid so that your visualizations aren't accidentally misleading:

What to avoid	**Why**
Cutting off the y-axis	Changing the scale on the y-axis can make the differences between different groups in your data seem more dramatic, even if the difference is actually quite small.
Misleading use of a dual y-axis	Using a dual y-axis without clearly labeling it in your data visualization can create extremely misleading charts.

Artificially limiting the scope of the data	If you only consider the part of the data that confirms your analysis, your visualizations will be misleading because they don't take all of the data into account.
Problematic choices in how data is binned or grouped	It is important to make sure that the way you are grouping data isn't misleading or misrepresenting your data and disguising important trends and insights.
Using part-to-whole visuals when the totals do not sum up appropriately	If you are using a part-to-whole visual like a pie chart to explain your data, the individual parts should add up to equal 100%. If they don't, your data visualization will be misleading.
Hiding trends in cumulative charts	Creating a cumulative chart can disguise more insightful trends by making the scale of the visualization too large to track any changes over time.
Artificially smoothing trends	Adding smooth trend lines between points in a scatterplot can make it easier to read that plot, but replacing the points with just the line can actually make it appear that the point is more connected over time than it actually was.

Finally, keep in mind that data visualization is an art form, and it takes time to develop these skills. Over your career as a data analyst, you will not only learn how to design good data visualizations, but you will also learn how to evaluate good data visualizations. Use these tips to think critically about data visualization—both as a creator and as an audience member.

Connecting images with data

Bar graphs ✧.*
Use size contrast to compare two or more values

Pie charts ✧.*
Show how much each part of something makes up the whole

Maps ✧.*
Helps organize data geographically

A recipe for a powerful visualization

- One of your biggest considerations when creating a data visualization is where you'd like your audience to focus.
- On the other hand, showing too little can make your visualization unclear and less meaningful.
- As a general rule, as long as it's not misleading, you should visually represent only the data that your audience needs in order to understand your findings.

Correlation charts ✧.*
Show relationships among data.

Causations ✧.*
Occurs when an action directly leads to an outcome.

Dynamic visualizations

Static visualizations ✧.*

Do not change over time unless they are edited

Dynamic visualizations ✧.*

Visualizations that are interactive or change overtime

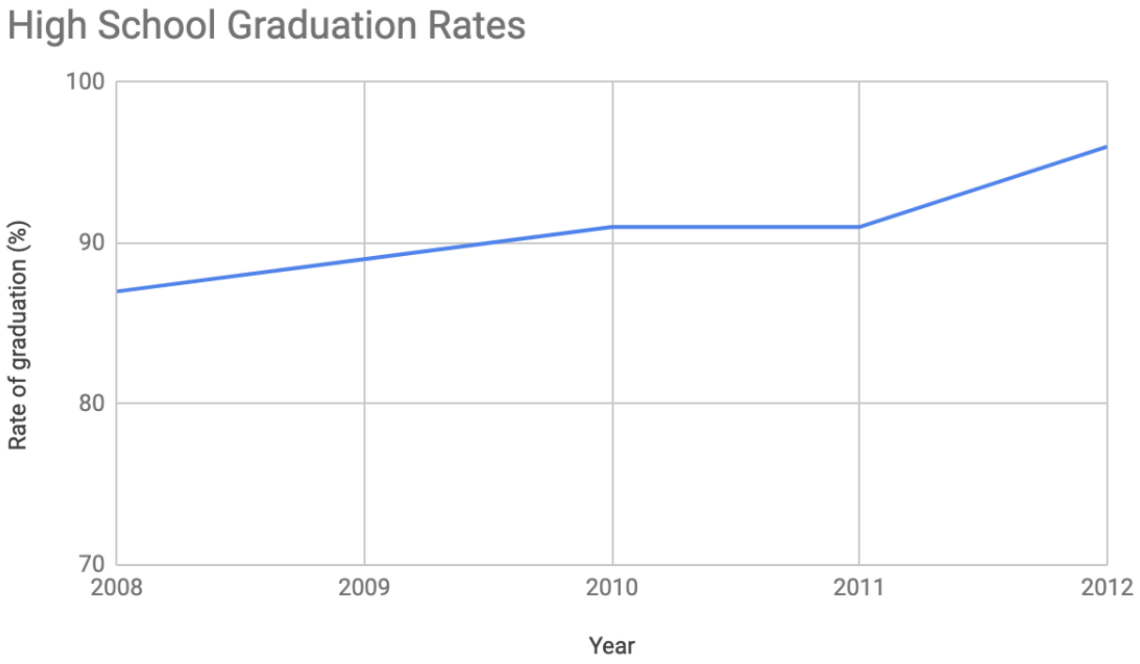
The wonderful world of visualizations

As a data analyst, you will often be tasked with relaying information and data that your audience might not readily understand. Presenting your data visually is an effective way to communicate complex information and engage your stakeholders. One question to ask yourself is: “what is the best way to tell the story within my data?” This reading includes several options for you to choose from (although there are many more).
Line chart

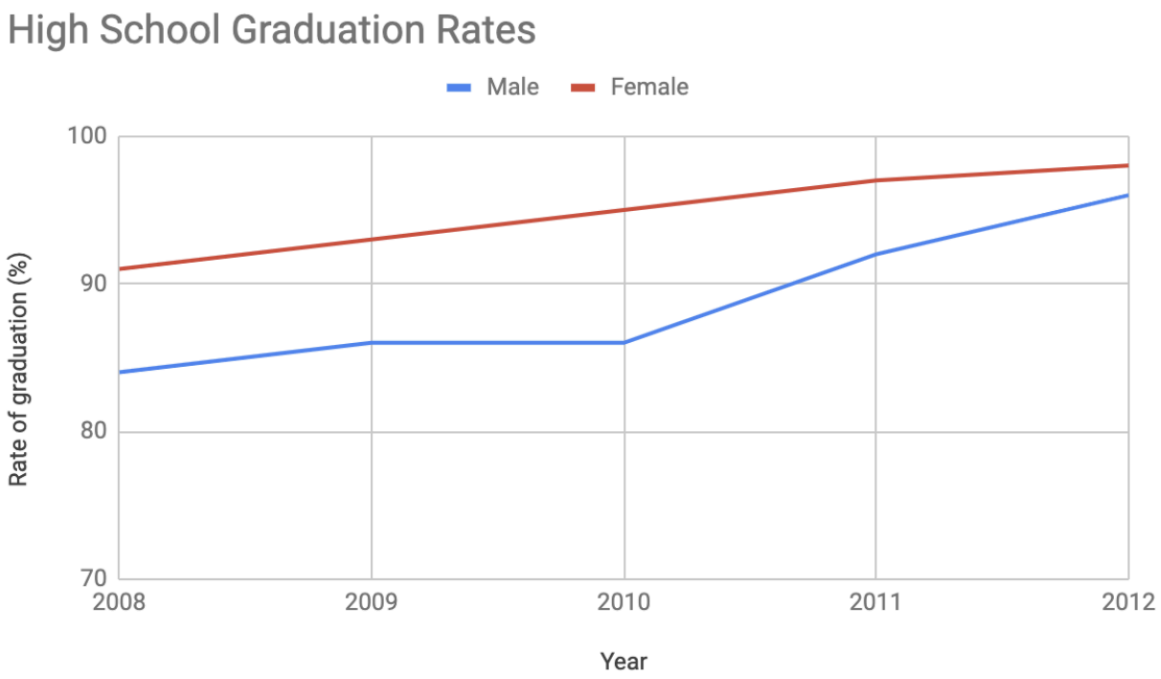
A **line chart** is used to track changes over short and long periods of time. When smaller changes exist, line charts are better to use than bar graphs. Line charts can also be used to compare changes over the same period of time for more than one group.
Let’s say you want to present the graduation frequency for a particular high school between the years 2008-2012. You would input your data in a table like this:

Year	Graduation rate
2008	87
2009	89
2010	92
2011	92
2012	96

From this table, you are able to present your data in a line chart like this:



Maybe your data is more specific than above. For example, let's say you are tasked with presenting the difference of graduation rates between male and female students. Then your chart would resemble something like this:



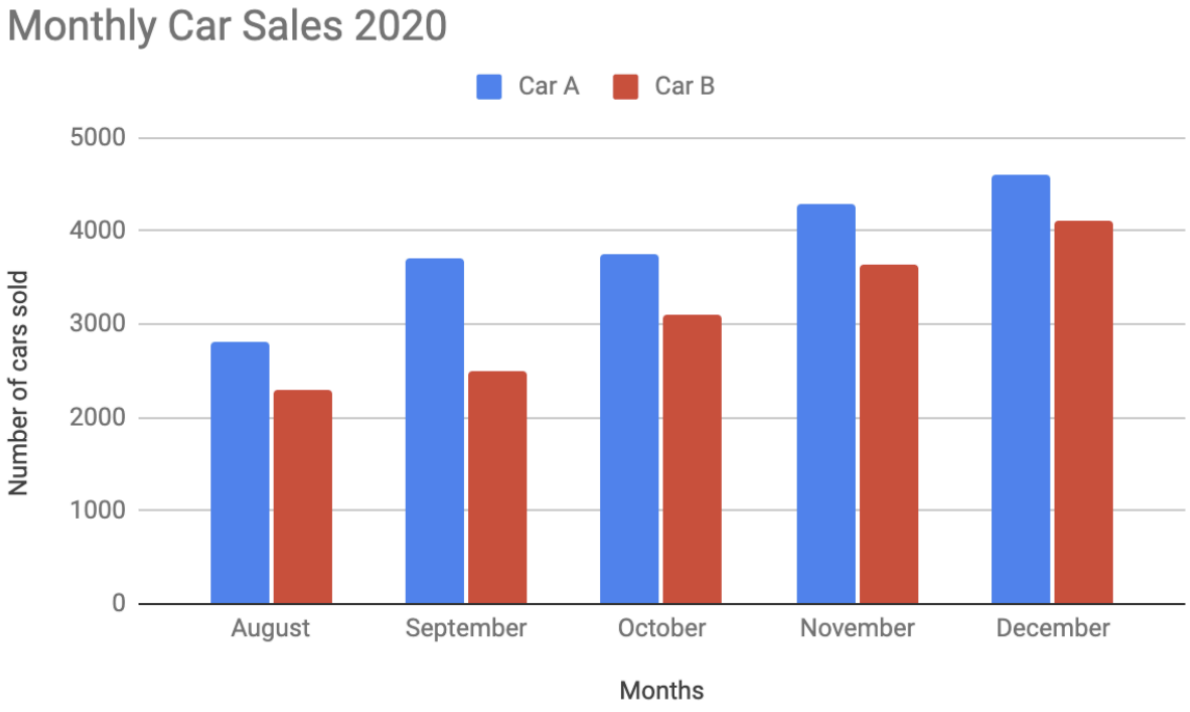
Column chart

Column charts use size to contrast and compare two or more values, using height or lengths to represent the specific values.
The below is example data concerning sales of vehicles over the course of 5 months:

Month	**Vehicles sold**
August	2,800
September	3,700
October	3,750
November	4,300
December	4,600

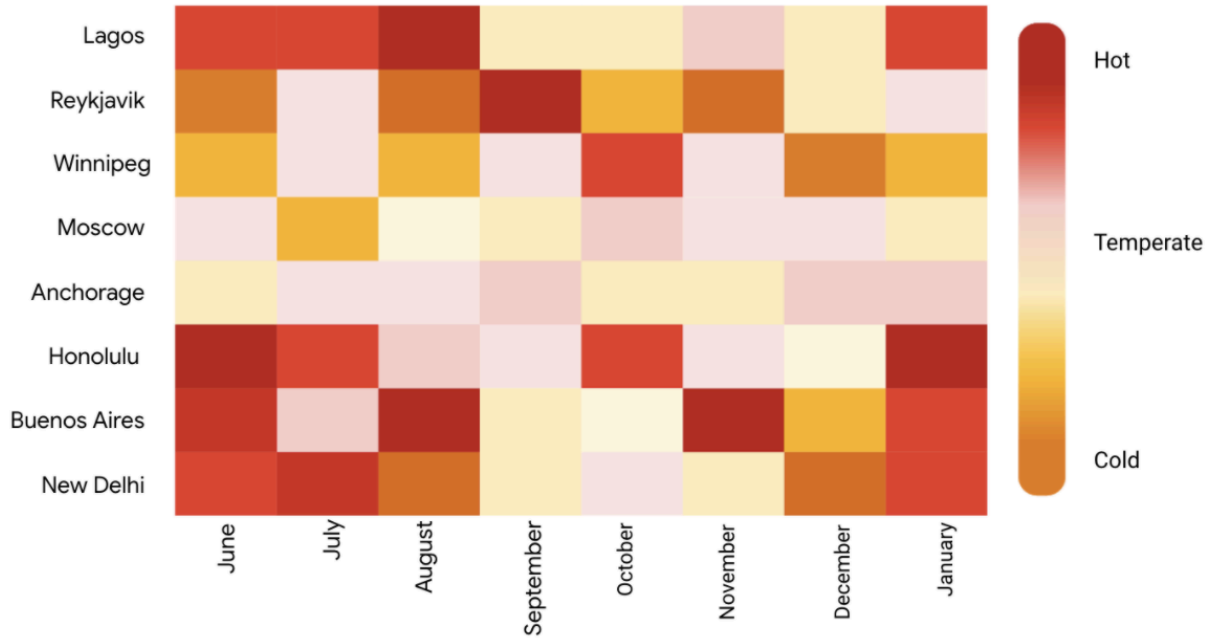
Visually, it would resemble something like this:

What would this column chart entail if we wanted to add the sales data for a competing car brand?



Heatmap

Similar to bar charts, **heatmaps** also use color to compare categories in a data set. They are mainly used to show relationships between two variables and use a system of color-coding to represent different values. The following heatmap plots temperature changes for each city during the hottest and coldest months of the year.

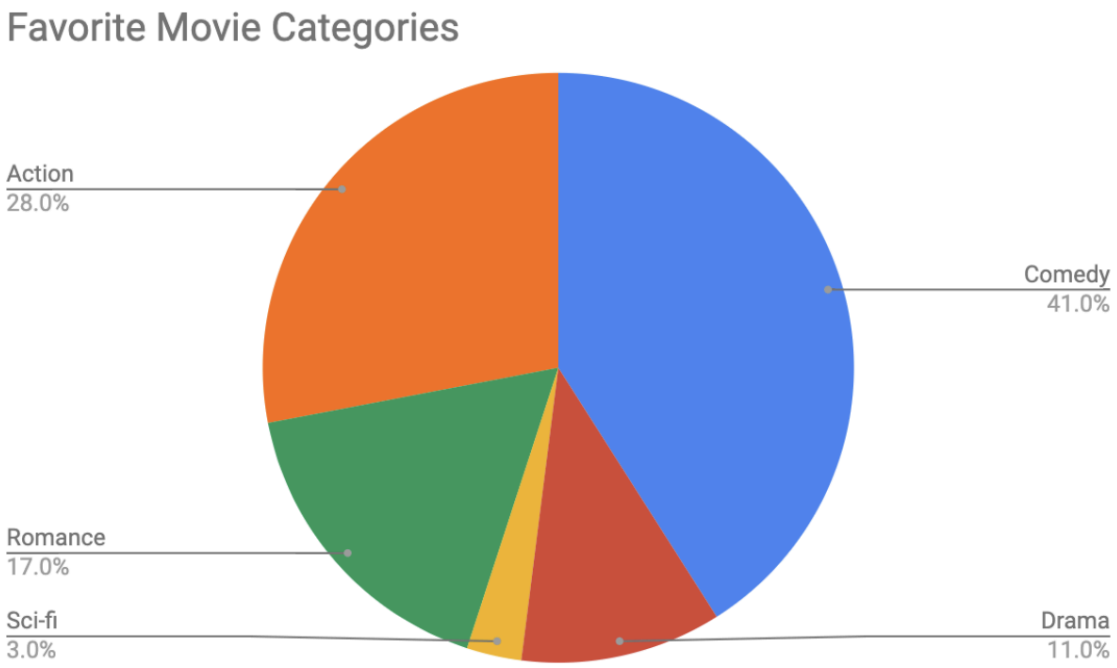


Pie chart

The **pie chart** is a circular graph that is divided into segments representing proportions corresponding to the quantity it represents, especially when dealing with parts of a whole. For example, let's say you are determining favorite movie categories among avid movie watchers. You have gathered the following data:

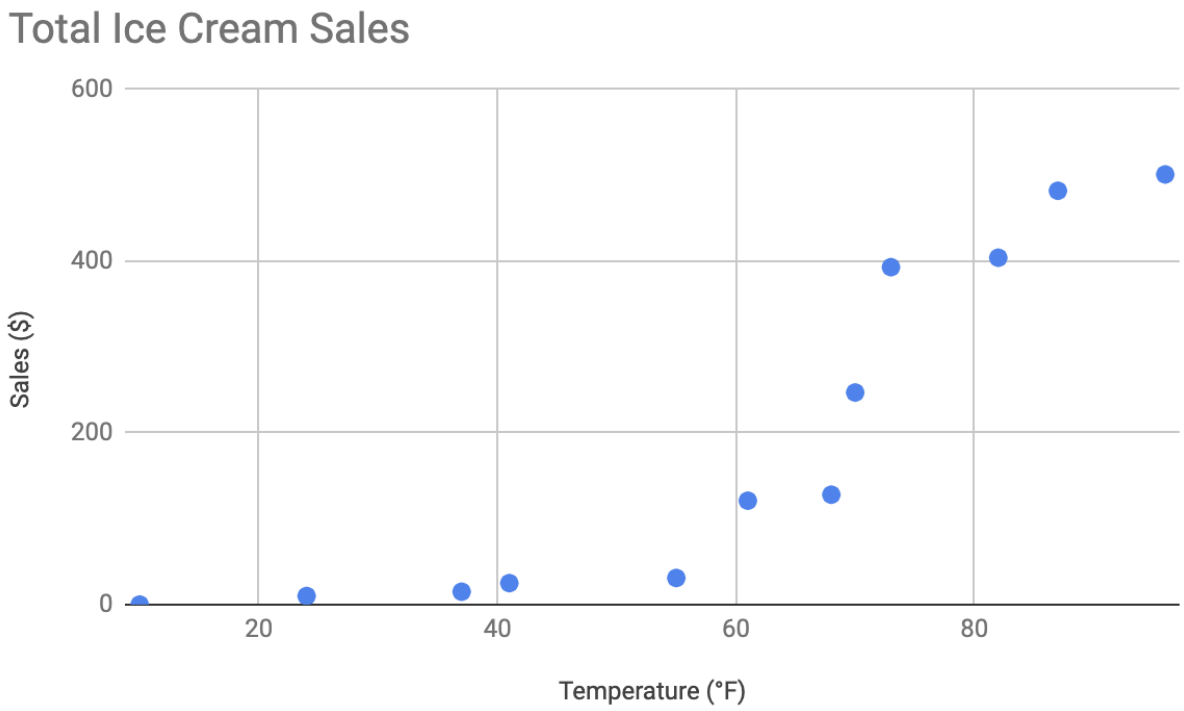
Movie category	**Preference**
Comedy	41%
Drama	11%
Sci-fi	3%
Romance	17%
Action	28%

Visually, it would resemble something like this:



Action- 28%
Comedy- 41%
Romance- 17%
Sci-fi- 3%
Drama- 11%
Scatterplot

Scatterplots show relationships between different variables. Scatterplots are typically used for two variables for a set of data, although additional variables can be displayed.
For example, you might want to show data of the relationship between temperature changes and ice cream sales. It would resemble something like this:

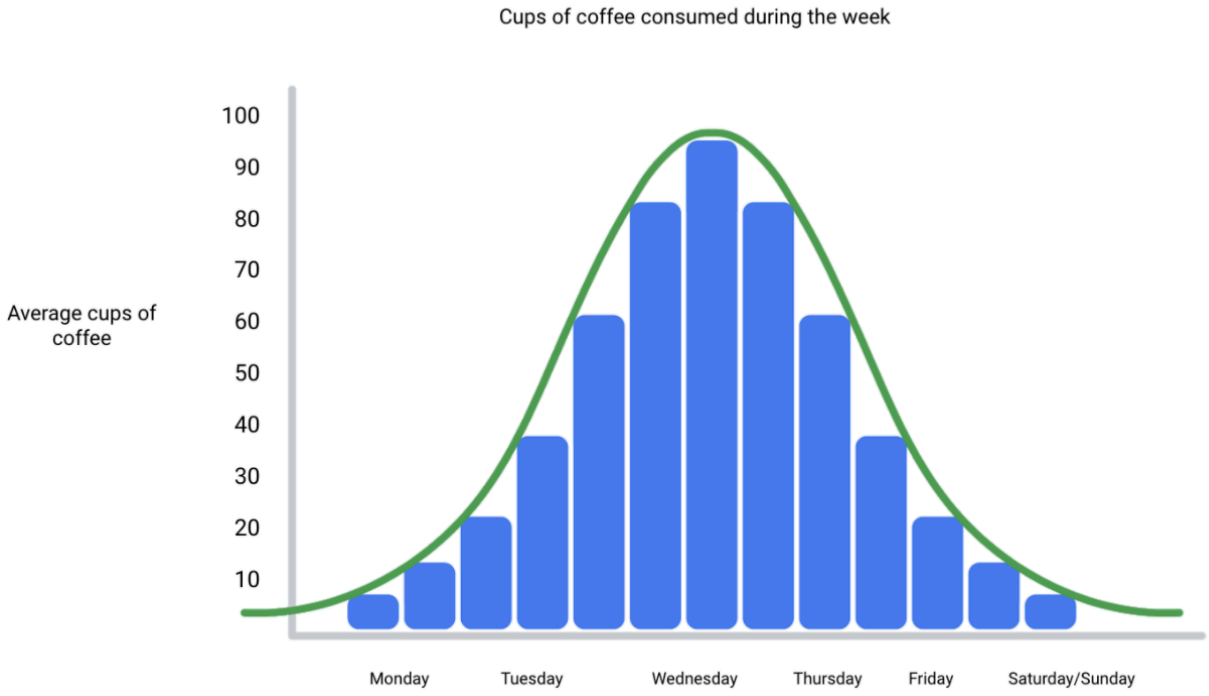


As you may notice, the higher the temperature got, the more demand there was for ice cream – so the scatterplot is great for showing the relationship between the two variables.

Distribution graph

A **distribution graph** displays the spread of various outcomes in a dataset.

Let's apply this to real data. To account for its supplies, a brand new coffee shop owner wants to measure how many cups of coffee their customers consume, and they want to know if that information is dependent on the days and times of the week. That distribution graph would resemble something like this:



From this distribution graph, you may notice that the amount of coffee sales steadily increases from the beginning of the week, reaching the highest point mid-week, and then decreases towards the end of the week.

If outcomes are categorized on the x-axis by distinct numeric values (or ranges of numeric values), the distribution becomes a **histogram**. If data is collected from a customer rewards program, they could categorize how many customers consume between one and ten cups of coffee per week. The histogram would have ten columns representing the number of cups, and the height of the columns would indicate the number of customers drinking that many cups of coffee per week.

Reviewing each of these visual examples, where do you notice that they fit in relation to your type of data? One way to answer this is by evaluating patterns in data. Meaningful patterns can take many forms, such as:

- **Change:** This is a trend or instance of observations that become different over time. A great way to measure change in data is through a line or column chart.
- **Clustering:** A collection of data points with similar or different values. This is best represented through a distribution graph.
- **Relativity:** These are observations considered in relation or in proportion to something else. You have probably seen examples of relativity data in a pie chart.
- **Ranking:** This is a position in a scale of achievement or status. Data that requires ranking is best represented by a column chart.
- **Correlation:** This shows a mutual relationship or connection between two or more things. A scatterplot is an excellent way to represent this type of data pattern.

Principles of design

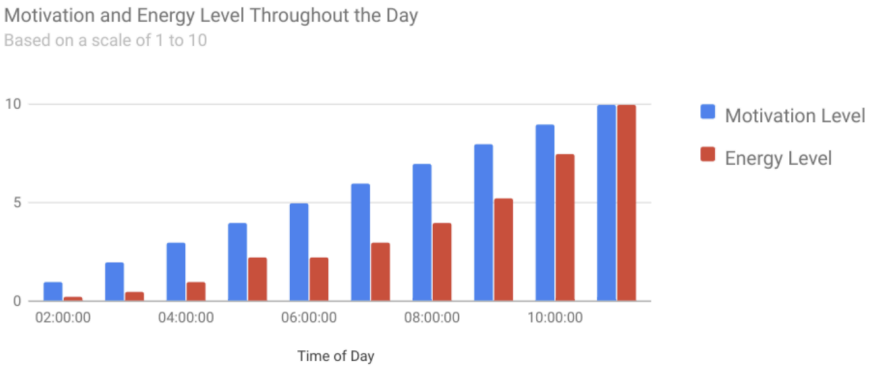
In this reading, you are going to learn more about using the elements of art and principles of design to create effective visualizations. So far, we have learned that communicating data visually is a form of art. Now, it's time to explore the nine design principles for creating beautiful and effective data visualizations that can be informative and appeal to all audiences.

After we go through the various design principles, spend some time examining the visual examples to ensure that you have a thorough understanding of how the principle is put into practice. Let's get into it!

Nine basic principles of design

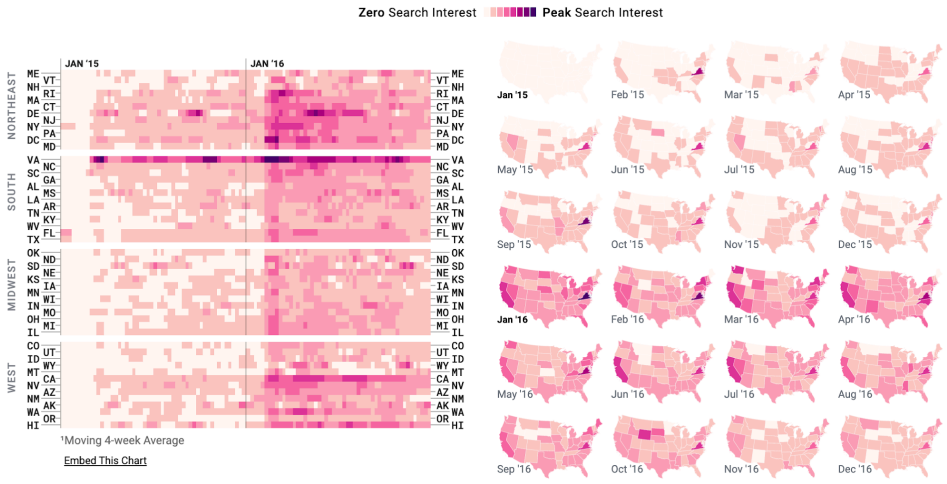
There are nine basic **principles of design** that data analysts should think about when building their visualizations.

1. Balance: The design of a data visualization is balanced when the key visual elements, like color and shape, are distributed evenly. This doesn't mean that you need complete symmetry, but your visualization shouldn't have one side distracting from the other. If your data visualization is balanced, this could mean that the lines used to create the graphics are similar in length on both sides, or that the space between objects is equal. For example, **this column chart** (also shown below) is balanced; even though the columns are different heights and the chart isn't symmetrical, the colors, width, and spacing of the columns keep this data visualization balanced. The colors provide sufficient contrast to each other so that you can pay attention to both the motivation level and the energy level displayed.



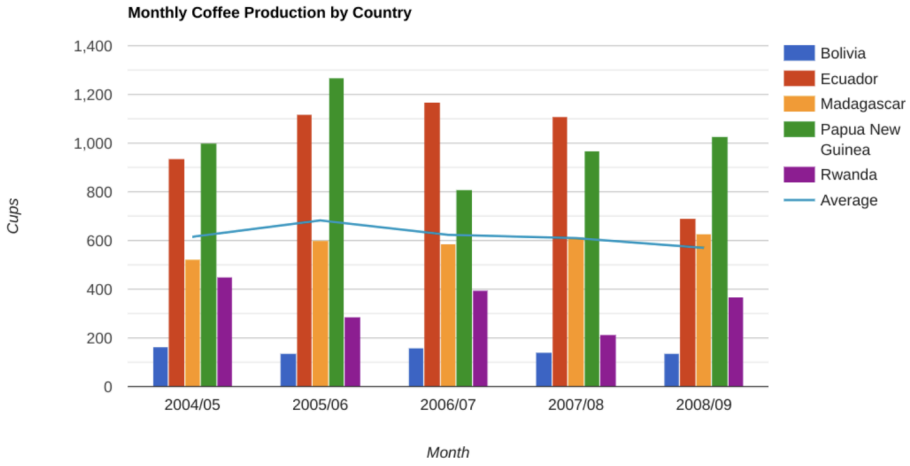
2. Emphasis: Your data visualization should have a focal point, so that your audience knows where to concentrate. In other words, your visualizations should emphasize the most important data so that users recognize it first. Using color and value is one effective way to make this happen. By using contrasting colors, you can make certain that graphic elements—and the data shown in those elements—stand out.

For example, you will notice a heat map data visualization below from **The Pudding's "Where Slang Comes From"** article. This heat map uses colors and value intensity to emphasize the states where search interest is highest. You can visually identify the increase in the search over time from low interest to high interest. This way, you are able to quickly grasp the key idea being presented without knowing the specific data values.



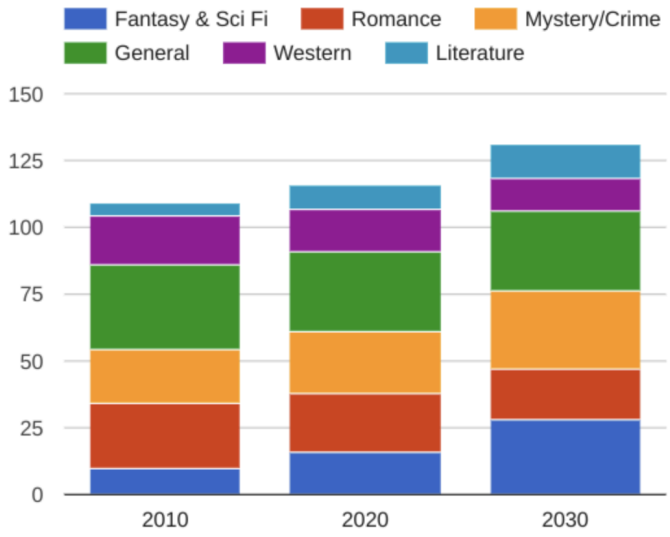
3. Movement: Movement can refer to the path the viewer's eye travels as they look at a data visualization, or literal movement created by animations. Movement in data visualization should mimic the way people usually read. You can use lines and colors to pull the viewer's attention across the page.

For example, notice how the average line in **this combo chart** (also shown below) draws your attention from left to right. Even though this example isn't moving, it still uses the movement principle to guide viewers' understanding of the data.



4. Pattern: You can use similar shapes and colors to create patterns in your data visualization. This can be useful in a lot of different ways. For example, you can use patterns to highlight similarities between different data sets, or break up a pattern with a unique shape, color, or line to create more emphasis.

In the example below, the different colored categories of **this stacked column chart** (also shown below) are a consistent pattern that makes it easier to compare book sales by genre in each column. Notice in the chart that the Fantasy & Sci Fi category (royal blue) is increasing over time even as the general category (green) is staying about the same.



5. Repetition: Repeating chart types, shapes, or colors adds to the effectiveness of your visualization. Think about the book sales chart from the previous example: the repetition of the colors helps the audience understand that there are distinct sets of data. You may notice this repetition in all of the examples we have reviewed so far. Take some time to review each of the previous examples and notice the elements that are repeated to create a meaningful visual story.

6. Proportion: Proportion is another way that you can demonstrate the importance of certain data. Using various colors and sizes helps demonstrate that you are calling attention to a specific visual over others. If you make one chart in a dashboard larger than the others, then you are calling attention to it. It is important to make sure that each chart accurately reflects and visualizes the relationship among the values in it. In **this dashboard** (also shown below), the slice sizes and colors of the pie chart compared to the data in the table help make the number of donuts eaten by each person the focal point.

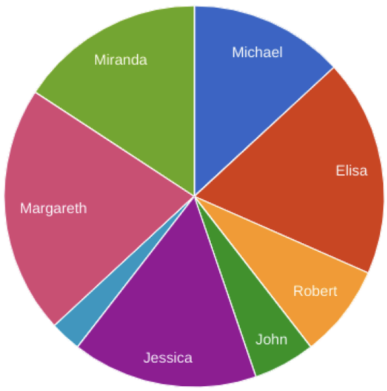
Donuts eaten per person

Age Filter:

3.0 54.0

Gender Selection:

Choose a value...



Name	Gender	Age	Donuts eaten
Michael	Male	12	5
Elisa	Female	20	7
Robert	Male	7	3
John	Male	54	2
Jessica	Female	22	6
Aaron	Male	3	1
Margareth	Female	42	8
Miranda	Female	33	6

These first six principles of design are key considerations that you can make while you are creating your data visualization. These next three principles are useful checks once your data visualization is finished. If you have applied the initial six principles thoughtfully, then you will probably recognize these next three principles within your visualizations already.

7. Rhythm: This refers to creating a sense of movement or flow in your visualization. Rhythm is closely tied to the movement principle. If your finished design doesn't successfully create a flow, you might want to rearrange some of the elements to improve the rhythm.

8. Variety: Your visualizations should have some variety in the chart types, lines, shapes, colors, and values you use. Variety keeps the audience engaged. But it is good to find balance since too much variety can confuse people. The variety you include should make your dashboards and other visualizations feel interesting and unified.

9. Unity: The last principle is unity. This means that your final data visualization should be cohesive. If the visual is disjointed or not well organized, it will be confusing and overwhelming. Being a data analyst means learning to think in a lot of different ways. These nine principles of design can help guide you as you create effective and interesting visualizations.

Design thinking for visualization improvement

Design thinking for data visualization involves five phases:

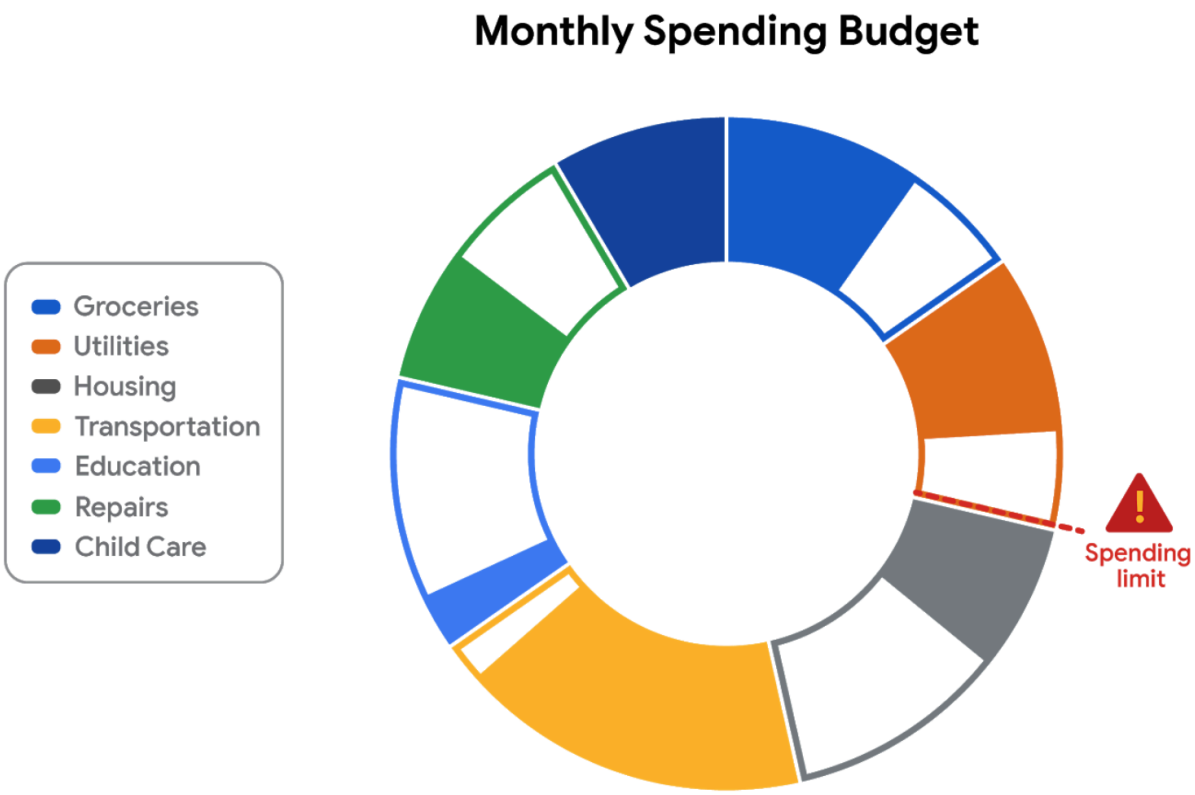
1. **Empathize:** Thinking about the emotions and needs of the target audience for the data visualization
2. **Define:** Figuring out exactly what your audience needs from the data
3. **Ideate:** Generating ideas for data visualization
4. **Prototype:** Putting visualizations together for testing and feedback
5. **Test:** Showing prototype visualizations to people before stakeholders see them

As interactive dashboards become more popular for data visualization, new importance has been placed on efficiency and user-friendliness. In this reading, you will learn how design thinking can improve an interactive dashboard. As a junior analyst, you wouldn't be expected to create an interactive dashboard on your own, but you can use design thinking to suggest ways that developers can improve data visualizations and dashboards.

An example: online banking dashboard

Suppose you are an analyst at a bank that has just released a new dashboard in their online banking application. This section describes how you might explore this dashboard like a new user would, consider a user's needs, and come up with ideas to improve data visualization in the dashboard. The dashboard in the banking application has the following data visualization elements:

- Monthly spending is shown as a donut chart that reflects different categories like utilities, housing, transportation, education, and groceries.
- When customers set a budget for a category, the donut chart shows filled and unfilled portions in the same view.
- Customers can also set an overall spending limit, and the dashboard will automatically assign the budgeted amounts (unfilled areas of the donut chart) to each category based on past spending trends.



Empathize

First, empathize by putting yourself in the shoes of a customer who has a checking account with the bank.

- Do the colors and labels make sense in the visualization?
- How easy is it to set or change a budget?
- When you click on a spending category in the donut chart, are the transactions in the category displayed?

What is the main purpose of the data visualization? If you answered that it was to help customers stay within budget or to save money, you are right! Saving money was a top customer need for the dashboard.

Define

Now, imagine that you are helping dashboard designers define other things that customers might want to achieve besides saving money.

What other data visualizations might be needed?

- Track income (in addition to spending)
- Track other spending that doesn't neatly fit into the set categories (this is sometimes called **discretionary spending**)
- Pay off debt

Can you think of anything else?

Ideate

Next, ideate additional features for the dashboard and share them with the software development team.

- What new data visualizations would help customers?
- Would you recommend bar charts or line charts in addition to the standard donut chart?
- Would you recommend allowing users to create their own (custom) categories?

Can you think of anything else?

Prototype

Finally, developers can prototype the next version of the dashboard with new and improved data visualizations.

Test

Developers can close the cycle by having you (and others) test the prototype before it is sent to stakeholders for review and approval.

Key takeaways

This design thinking example showed how important it is to:

- Understand the needs of users
- Generate new ideas for data visualizations
- Make incremental improvements to data visualizations over time

You can refer to the following articles for more information about design thinking:

- Three Critical Aspects of Design Thinking for Big Data Solutions
- Data and Design Thinking: Why Use Data in the Design Process?

Headlines, subtitles, and labels

Headline ✧.*

a line of words printed in large letters at the top of the visualization to communicate what data is being presented. Try to avoid using abbreviations or acronyms, even if you think they're common knowledge. The typography and placement of the headline is important too. It's best to keep it simple. Make it bold or a few sizes larger than the rest of the text and place it directly above the chart, aligned to the left.

Subtitles ✧.*

supports the headline by adding more context and description. Use a font style that matches the rest of the charts elements and place the subtitle directly underneath the headline.

Labels ✧.*

Identifies the meaning of various elements in a data visualization

Legend ✧.*

A legend or key identifies the meaning of various elements in a data visualization and can be used as an alternative to labeling data directly

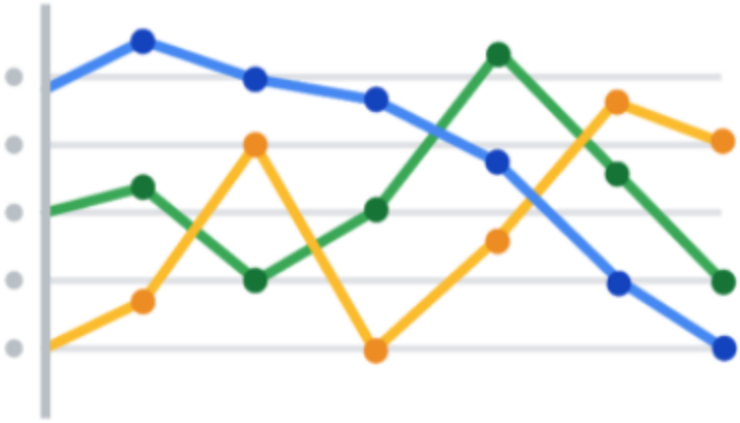
Pro tips for highlighting key information

Headlines, subtitles, labels, and annotations help you turn your data visualizations into more meaningful displays. After all, you want to invite your audience into your presentation and keep them engaged. When you present a visualization, they should be able to process and understand the information you are trying to share in the first five seconds. This reading will teach you what you can do to engage your audience immediately.
If you already know what headlines, subtitles, labels and annotations do, go to the guidelines and style checks at the end of this reading. If you don't, these next sections are for you.
Headlines that pop

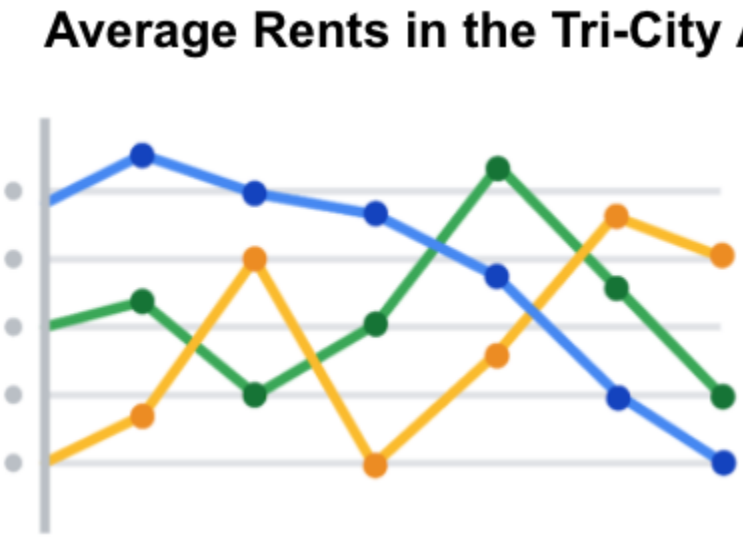
A **headline** is a line of words printed in large letters at the top of a visualization to communicate what data is being presented. It is the attention grabber that makes your audience want to read more. Here are some examples:

- Which Generation Controls the Senate?: This headline immediately generates curiosity. Refer to the subreddit post in the dataisbeautiful community, r/dataisbeautiful, on January 21, 2021.
- Top 10 coffee producers: This headline immediately informs how many coffee producers are ranked. Read the full article: bbc.com/news/business-43742686.

Check out the chart below. Can you identify what type of data is being represented? Without a headline, it can be hard to figure out what data is being presented. A graph like the one below could be anything from average rents in the tri-city area, to sales of competing products, or daily absences at the local elementary, middle, and high schools.



Turns out, this illustration is showing average rents in the tri-city area. So, let's add a headline to make that clear to the audience. Adding the headline, "**Average Rents in the Tri-City Area**" above the line chart instantly informs the audience what it is comparing.

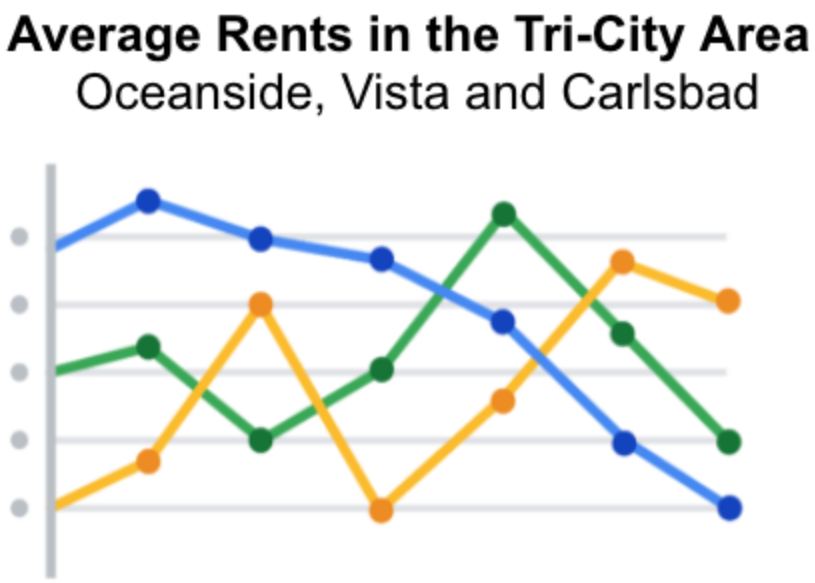


Subtitles that clarify

A **subtitle** supports the headline by adding more context and description. Adding a subtitle will help the audience better understand the details associated with your chart. Typically, the text for subtitles has a smaller font size than the headline.

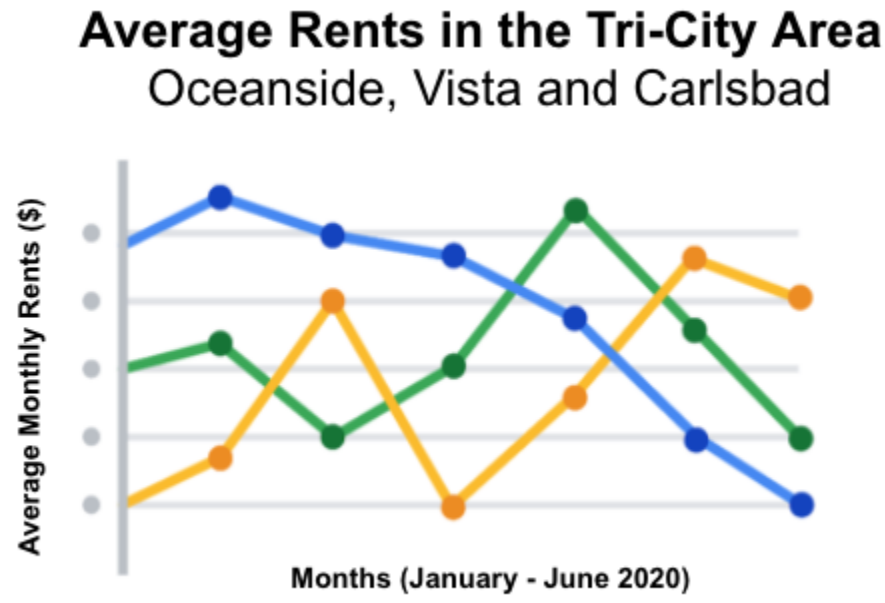
In the average rents chart, it is unclear from the headline "**Average Rents in the Tri-City Area**" which cities are being described. There are tri-cities near San Diego, California (Oceanside, Vista, and Carlsbad), tri-cities in the San Francisco Bay Area (Fremont, Newark, and Union City), tri-cities in North Carolina (Raleigh, Durham, and Chapel Hill), and tri-cities in the United Arab Emirates (Dubai, Ajman, and Sharjah).

We are actually reporting the data for the tri-city area near San Diego. So adding "**Oceanside, Vista, and Carlsbad**" becomes the subtitle in this case. This subtitle enables the audience to quickly identify which cities the data reflects.



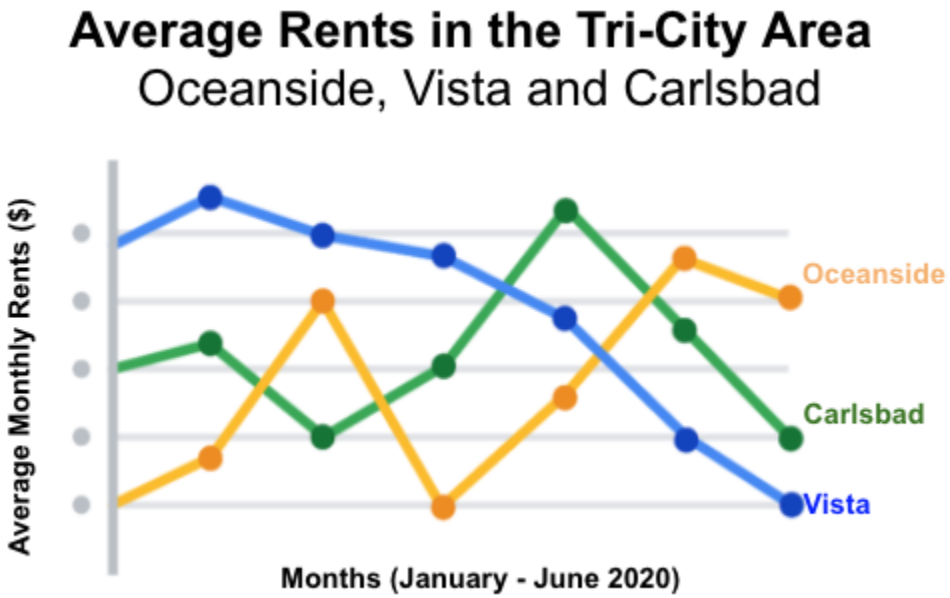
Labels that identify

A **label** in a visualization identifies data in relation to other data. Most commonly, labels in a chart identify what the x-axis and y-axis show. Always make sure you label your axes. We can add "**Months (January - June 2020)**" for the x-axis and "**Average Monthly Rents ($)**" for the y-axis in the average rents chart.



Data can also be labeled directly in a chart instead of through a chart legend. This makes it easier for the audience to understand data points without having to look up symbols or interpret the color coding in a legend.

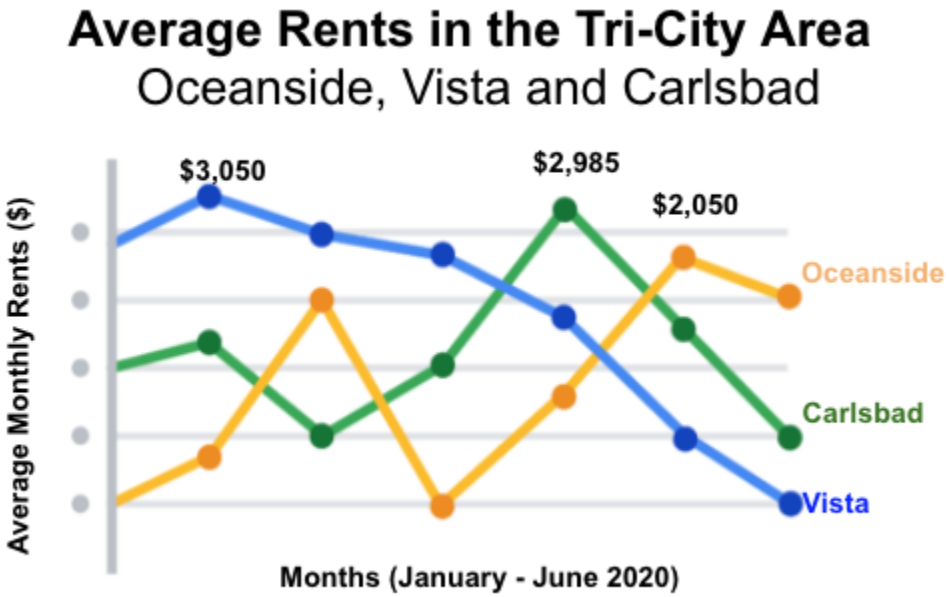
We can add direct labels in the average rents chart. The audience can then identify the data for Oceanside in yellow, the data for Carlsbad in green, and the data for Vista in blue.



Annotations that focus

An **annotation** briefly explains data or helps focus the audience on a particular aspect of the data in a visualization.

Suppose in the average rents chart that we want the audience to pay attention to the rents at their highs. Annotating the data points representing the highest average rents will help people focus on those values for each city.



Week II

Optimize the color palette in data visualization

Diverging color palette ✧.*
Displays two ranges of values using color intensity to show the magnitude of the number and the actual color to show which range the numbers from.

Red: Negative, Green: Positive

Tableau resources for combining multiple data sources

Resource	Description
Set up data sources	This page links to other resources explaining how to set up your data sources and prepare them for analysis once you have connected them to your Tableau account. It specifically includes articles explaining how to join or blend data, and what a union is and how they work. This is a great starting point as you get ready to begin using and combining data sources.
Join your data	Joining refers to the process of combining data sources based on common fields. This article gives a more detailed explanation of the different joins, how to use them in Tableau, and an example join with a step-by-step guide.
Don't be scared of relationships	Relationships allow you to combine multiple data sources in Tableau. This is a more flexible alternative to joins, and doesn't force you to create one single table with your multiple data sources. This article will give you more insight into how relationships work.
How relationships differ from joins	This article goes into more detail about the differences between using relationships and joins, and guides you through the process of using relationships to combine data.
Blend your data	Data blending is another method you can use to combine multiple data sources. Instead of truly combining the data, blends allow you to query and aggregate data from multiple sources. This resource goes into more detail about blending and includes a tutorial.

Combining multiple date fields	This resource provides examples that explain how to combine date fields when using four different methods of data combination in Tableau.

Week III

Bringing ideas to life

"Numbers have an important story to tell. They rely on you to give them a clear and convincing voice." -Stephen Few

Data Storytelling ✧.*
communicating the meaning of a data set with visuals and a narrative that are customized for each particular audience.

- **Engage your audience** requires gathering audience and stakeholder insights so you can plan to tell a story that resonates.
- **Create compelling visuals** means making the data tell a story at a glance. If possible, make visuals interactive.
- **Tell the story in an interesting way** means crafting a compelling story and giving your audience recommendations to take away.

Speaking to your audience

Spotlighting ✧.*
Scanning through data to quickly identify the most important insights.

Compelling presentation tips

The narrative you share with your stakeholders needs characters, a setting, a plot, a big reveal, and an "aha moment"

- **Character** This could be your stakeholders, customers, clients, and others. When adding information about your characters to your story, you have a great opportunity to include a personal account and bring more human context to the facts that the data has revealed—think about why they care.

- **Setting** describes what's going on, how often it's happening, what tasks are involved, and other background information about the data project that describes the current situation.
- **Plot** sometimes called the conflict, is what creates tension in the current situation. This could be a challenge from a competitor, an inefficient process that needs to be fixed, or a new opportunity that the company just can't pass up. This complication of the current situation should reveal the problem your analysis is solving and compel the characters to act.
- **Big Reveal, sometimes** called the conflict, is what creates tension in the current situation. This could be a challenge from a competitor, an inefficient process that needs to be fixed, or a new opportunity that the company just can't pass up. This complication of the current situation should reveal the problem your analysis is solving and compel the characters to act.
- **Aha Moment** when you share your recommendations and explain why you think they'll help your company be successful.

Week VI

Presenting with a framework

To make your data findings accessible to your audience, you'll need a framework to guide your presentation. This helps to create logical connections that tie back to the business tasks and metrics.

- The framework of your presentation starts with your understanding of the business task.
- By showcasing what business metrics you used, you can help your audience understand the impact your findings will have

Weaving data into your presentation

- Establishing the hypothesis early in the presentation will help your audience understand the data

The McCandless Method

1. Introduce the graphic by name
2. Answer obvious questions before they're asked
3. State the insight of your graphic
4. Call out data to support that insight
5. Tell your audience why it matters

Proven presentation tips

1. Channel your excitement
2. Start with the broader ideas
3. Use the five second rule
    - Wait five seconds after showing data visualization
    - Ask if they understand (If they don't, explain)
    - Give your audience another five seconds
    - Tell them conclusion
4. Preparation is key