Introduction to Plotting

Understanding Data Through Visualizations

Think-Share Activity

What is a **graph**? What kinds of things do you think of as a graph?

What is a **chart**? What kinds of things do you think of as a chart?

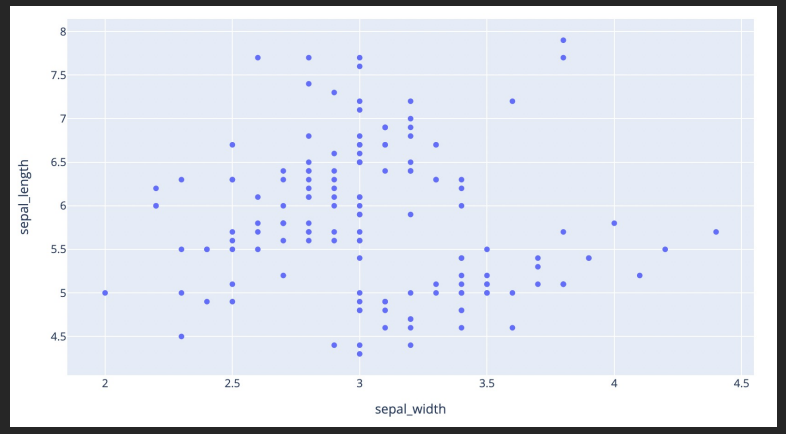
What is a **plot**? What kinds of things do you think of as a plot?

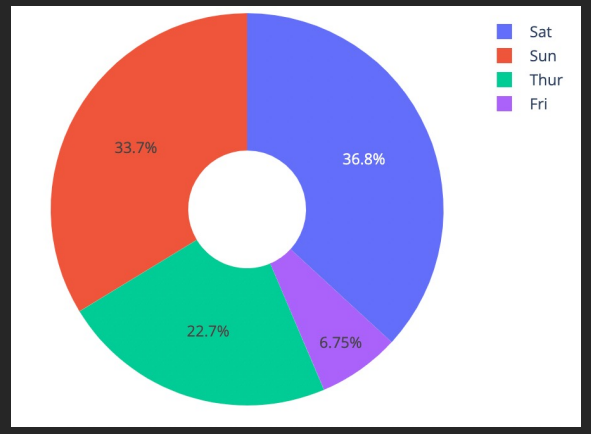
Data Science Terminology

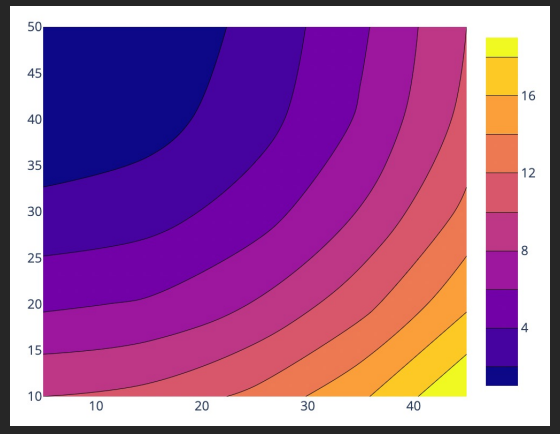
- A **chart** is a broad term for any type of data visualization.
- A **graph** is a type of **chart** showing the relationship of quantities, especially such a diagram in which lines, bars, or proportional areas represent how one quantity depends on or changes with another.
- We can **plot** a dataset into one or more types of **chart**.

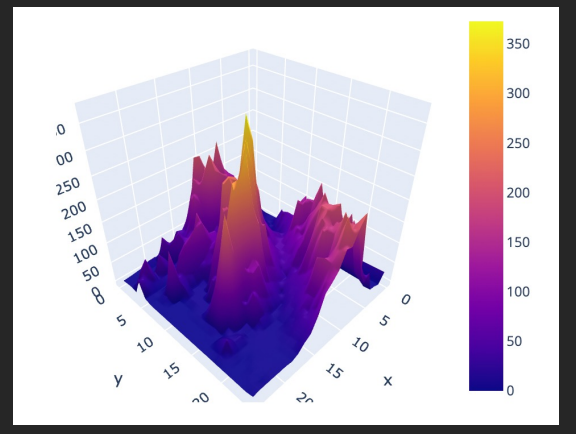
Think-Share Activity

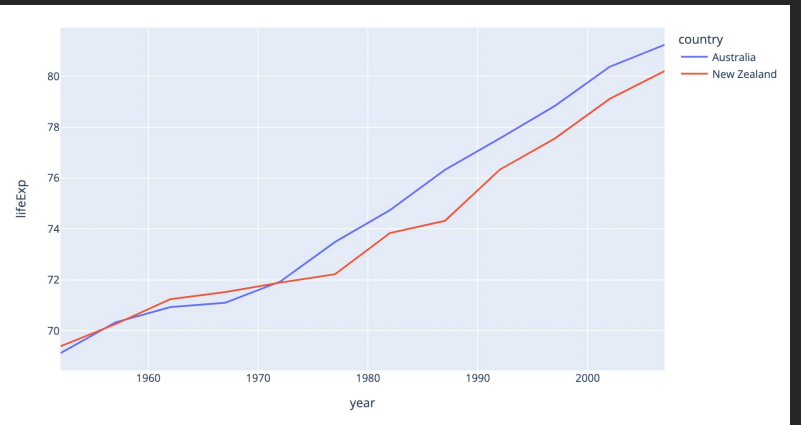
- These are all **charts** but you might know them by other names!
- Can you name these?

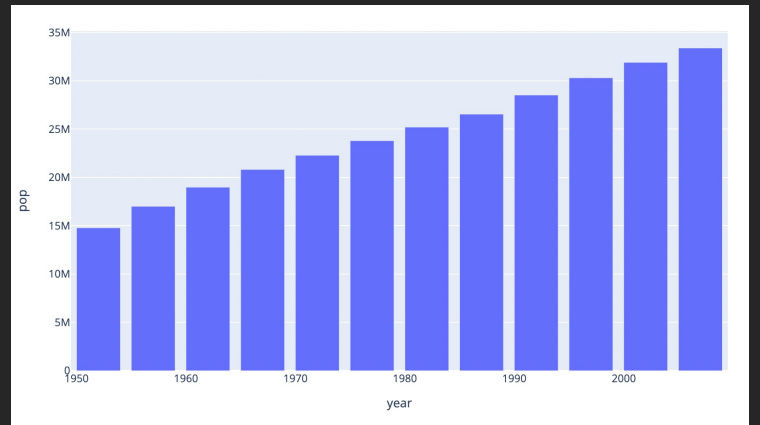


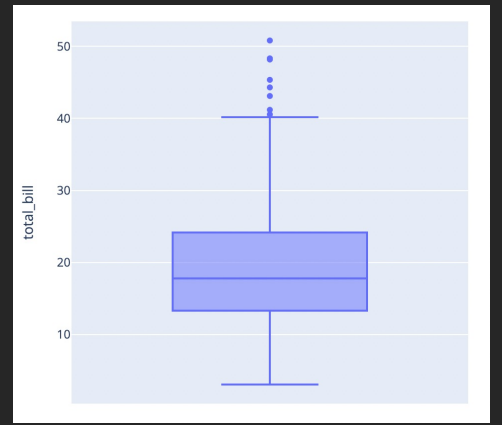


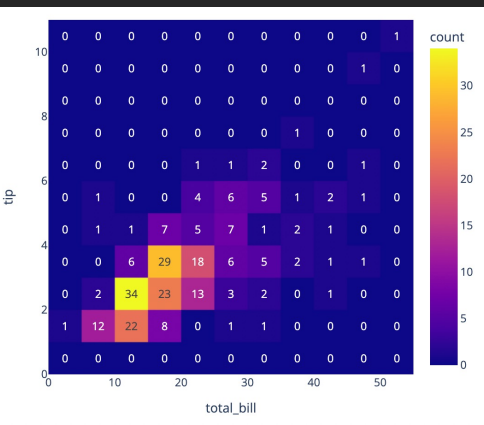






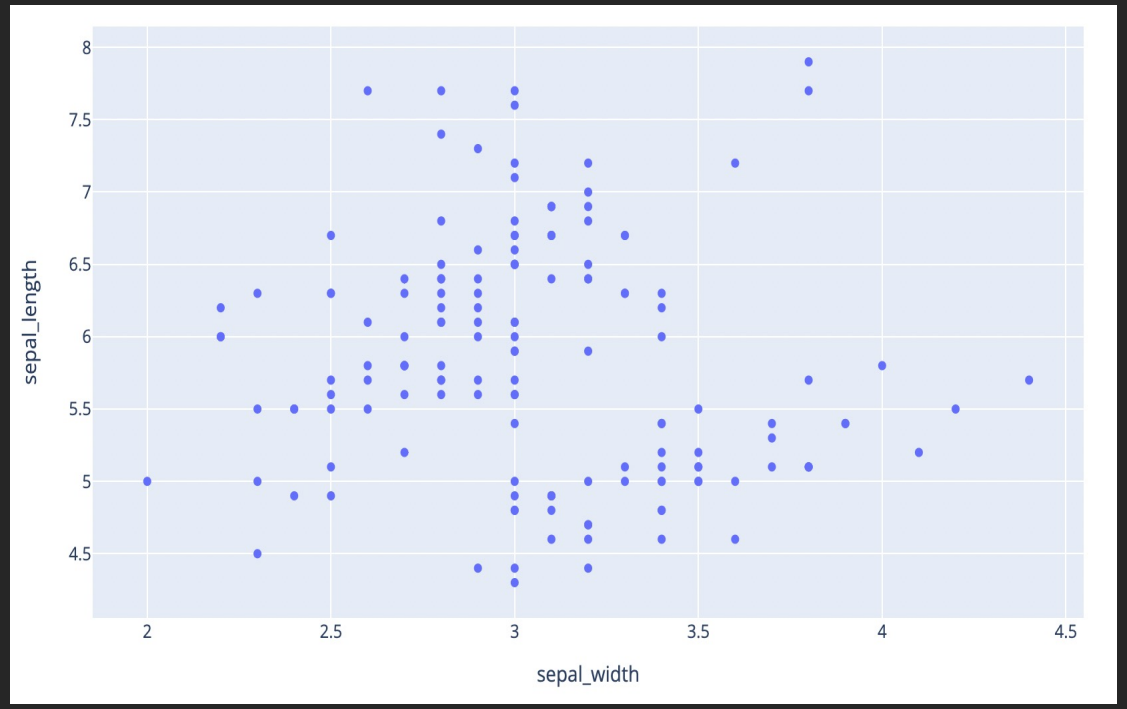




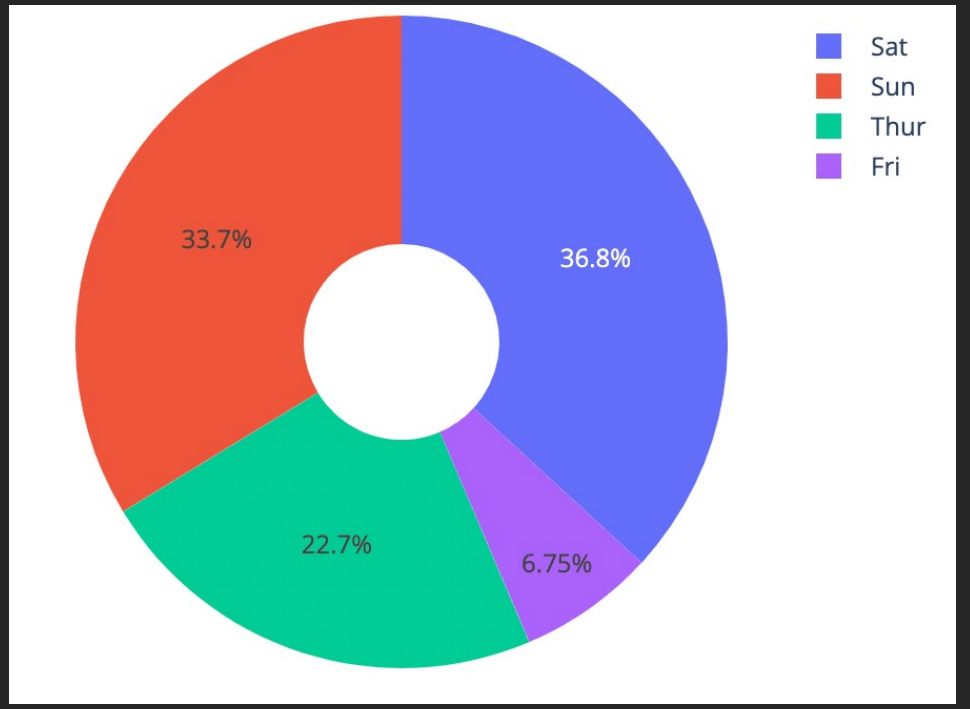


Charts

- Scatter Plot

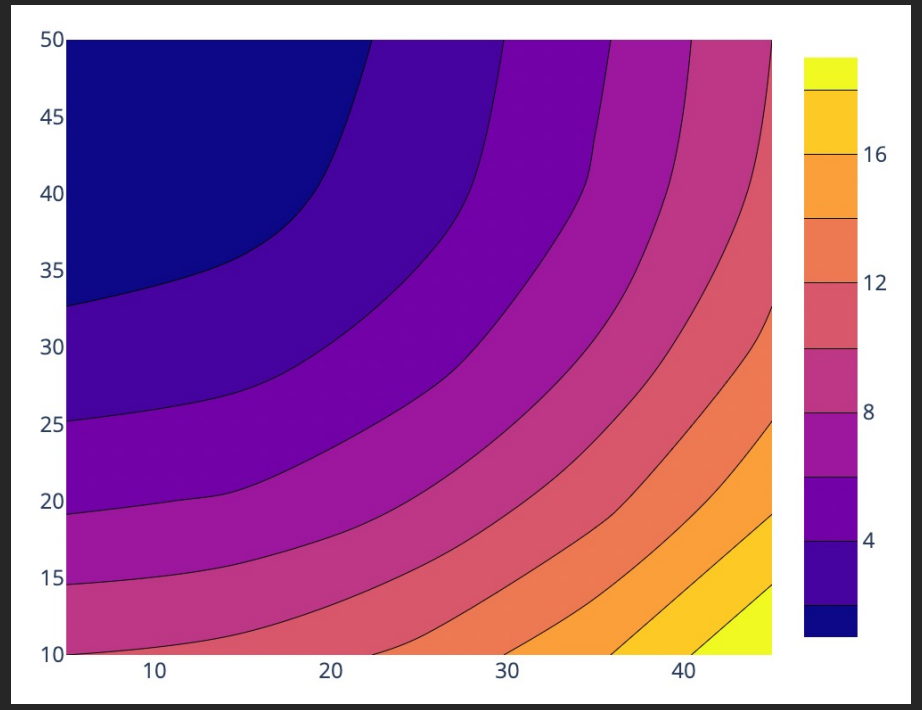


- Pie Chart

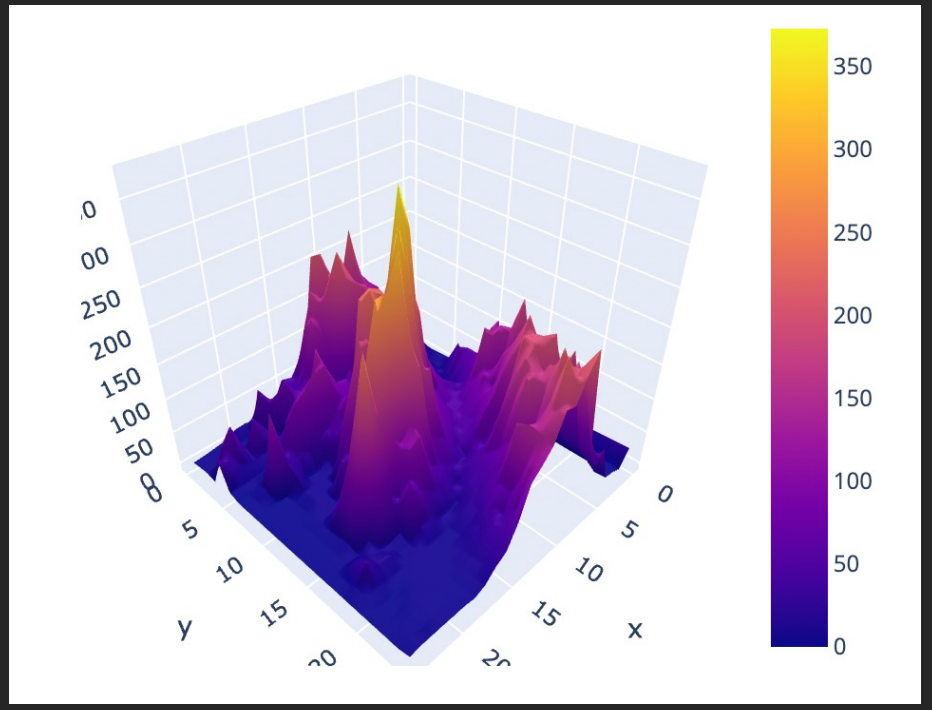


Charts

- Contour Plot

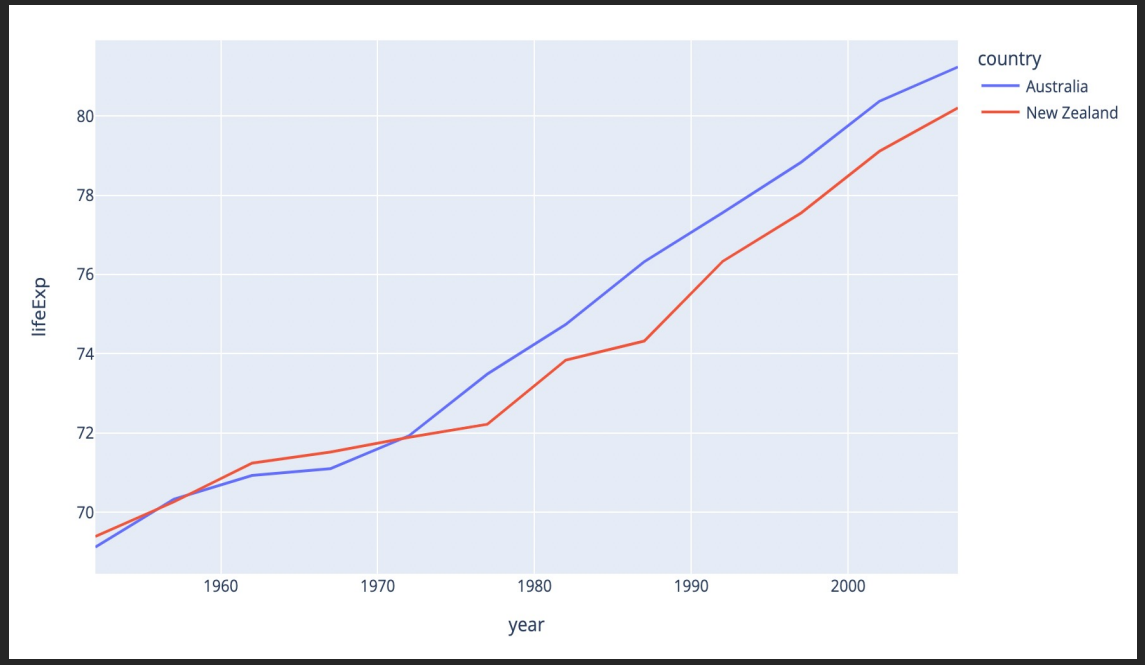


- 3D Surface Plot

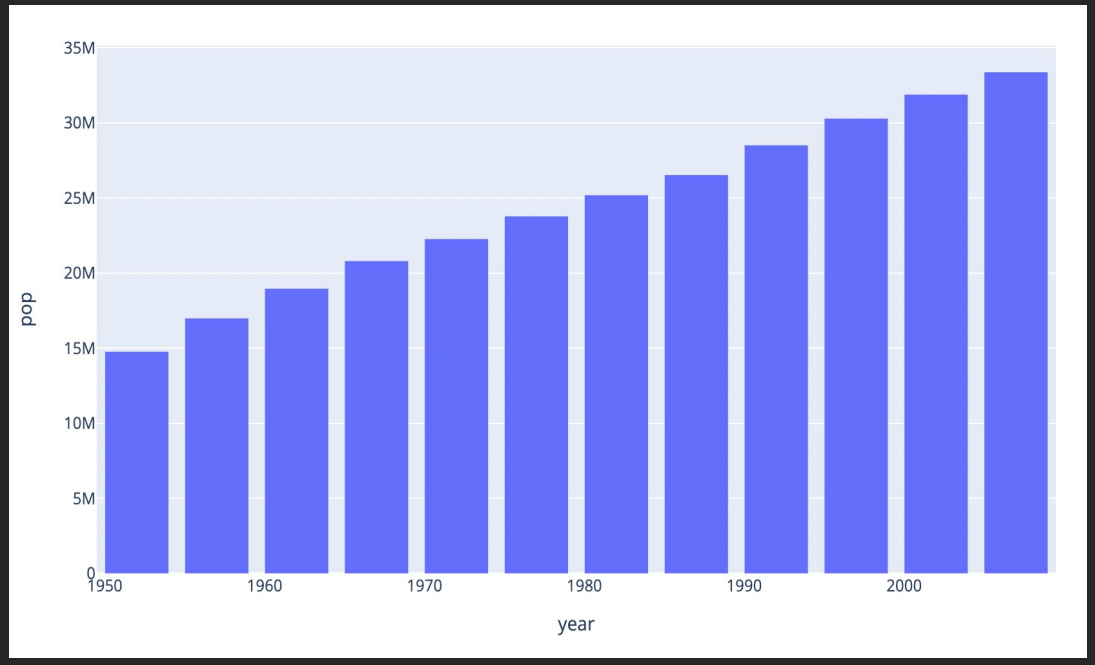


Charts

- Line Chart

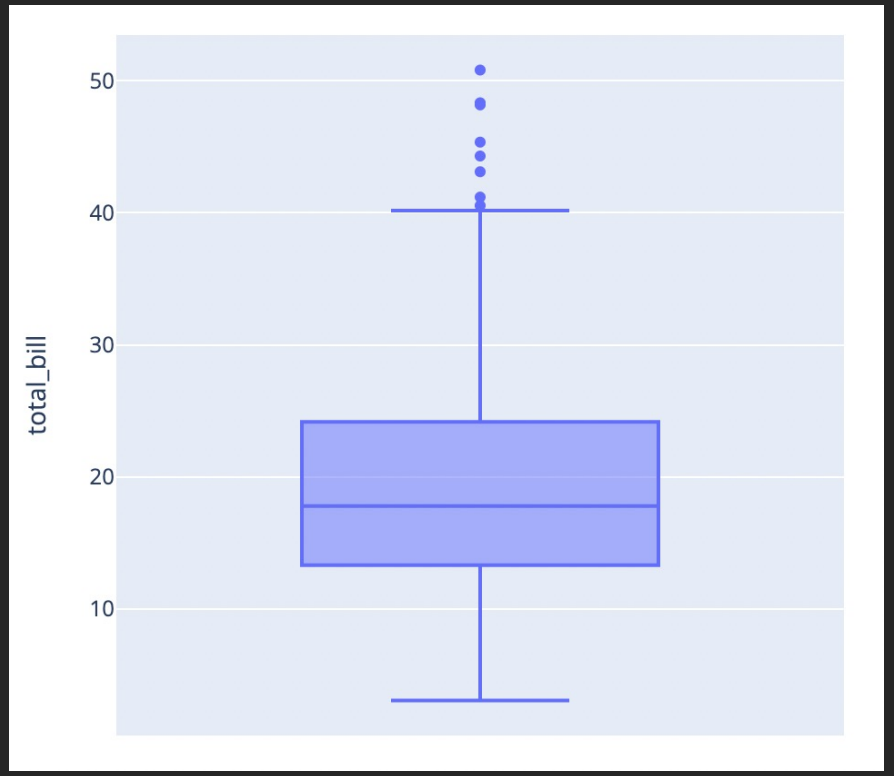


- Bar Chart or Histogram

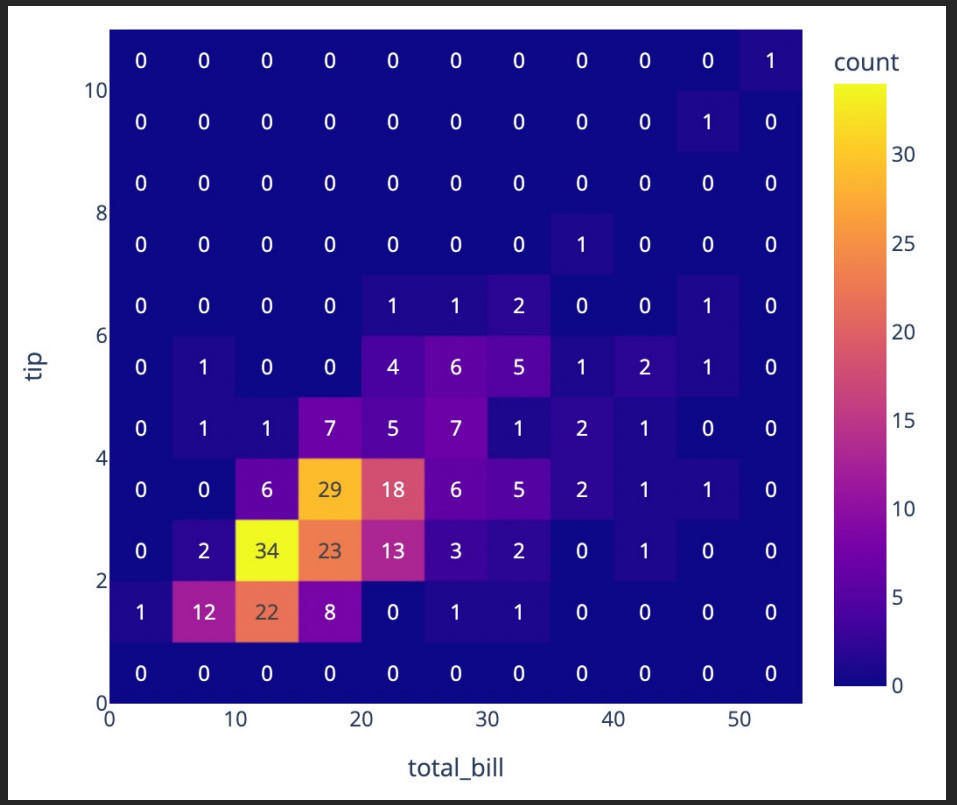


Charts

- Box Plot



- 2D Histogram or Heatmap



Think-Share Activity

What were your first experiences with graphs in school?

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Do you remember **plotting equations**?

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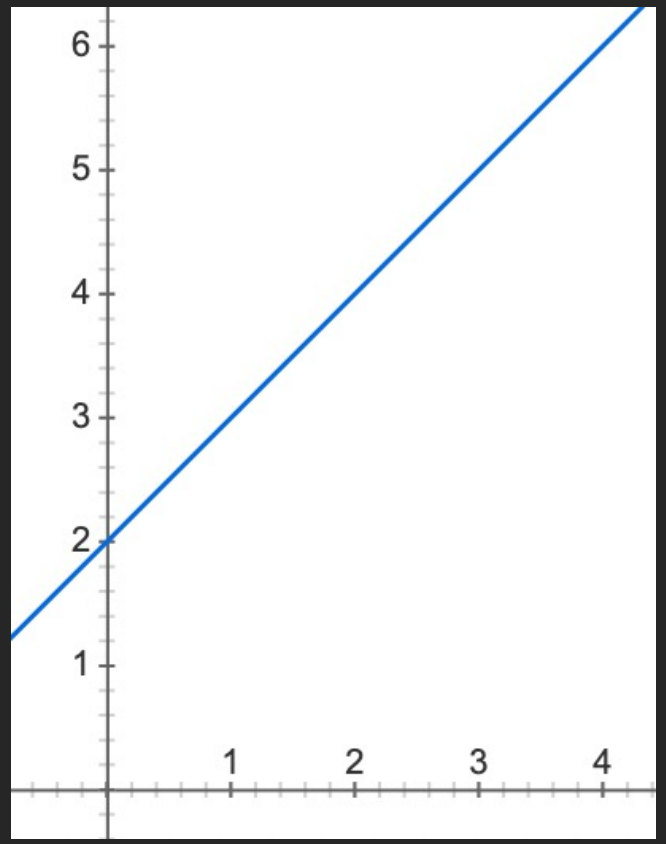
Do you remember **plotting equations**?

$y = x + 2$?



Plotting Equations

Given $y = x + 2$, how do we plot?

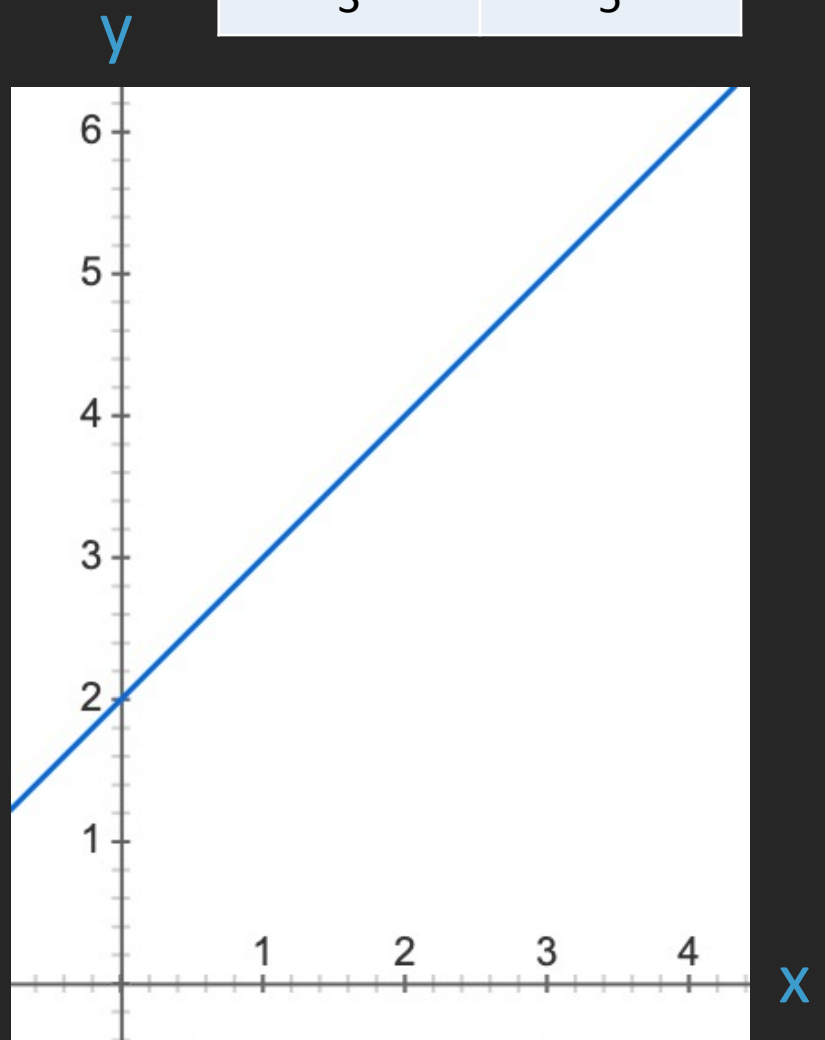
Plotting Equations

Given y = x + 2, how do we plot?

x	y
0	2
1	3
2	4
3	5

How-to Plot Equations:

1. Choose a few (2+) values of x and calculate y
2. Draw the **x-axis** and **y-axis**, with **ticks**
3. Plot each **datapoint** (x, y)
4. Draw a **line** that goes through all points



Demo: Plot y = x - 1

Activity 1: Plotting Equations

Plot $y = 2x + 1$

On scratch paper:

1. Choose a few values of x and calculate y
2. Draw the **x-axis** and **y-axis**, with **ticks**
3. Plot each **datapoint** (x, y)
4. Draw a **line** that goes through all points
5. When done, call a mentor over to check your work.

Plotting Equations vs Plotting Datasets

Plotting Equations:

- Relationship between x & y is known
  - It is given by the equation!
- We make datapoints to cleanly illustrate the relationship

Plotting Datasets:

- Relationship between x & y is unknown
  - It is what we are looking for!
- We have datapoints which may or may not illustrate the relationship

Summary

- Plotting terminology in data science
- Plotting equations
- Plotting equations vs plotting datasets