

# **Generative AI**

## **Data Visualizations with AI**

# LEARNING OBJECTIVES

By the end of the lesson, you will be able to...

- Identify the different types of data visualization that can be generated by ADA.
- Apply prompt and refinement techniques to generate interactive data visualizations.
- Use ChatGPT to build a downloadable dashboard.



# LEARN

## Data Visualization 101





**Visualization gives you answers to questions you didn't know you had.**

- Ben Schneiderman, *Stanford University*  
*Professor of Computer Science*

# PARTNER EXERCISE: Foundations of Data Visualization

15 Minutes

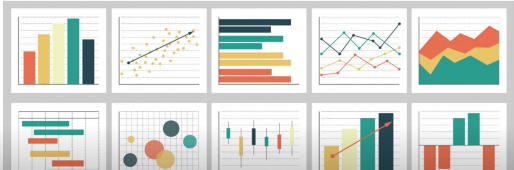
## In pairs, complete this microlesson

- ☐ Explain why data visualization is important
- ☐ Distinguish between good and bad data graphics
- ☐ Choose the best visualizations to communicate different data
- ☐ Understand and apply the principles of good data visualization

### What is Data Visualization?

Data visualization is the **graphical representation of information and data**. By using visual elements like charts, graphs, and maps, data visualization tools **provide an accessible way to see and understand trends, outliers, and patterns** in data. Additionally, it provides an excellent way for employees or business owners to **present data to non-technical audiences without confusion**.

source: [tableau.com](https://tableau.com)



# Think About It: Data Viz 🤔

What was your main takeaway from Foundations of Data Visualization?



Type your response  
in the chat.

# PRACTICE

**Visualize on a Map**



# Let's Visualize!

We're going to now visualize some [geospatial data](#).

**From the curator:** “The goal of this dataset is to provide valuable insights into the air quality of different regions, allowing researchers and policymakers to make informed decisions on how to address the issue of air pollution.”



ADITYA RAMACHANDRAN · UPDATED 5 MONTHS  
AGO



79

New Notebook



Download (381 kB)



## World Air Quality Index by City and Coordinates

A Comprehensive Dataset on Cities, Latitude, Longitude, and Pollution Levels



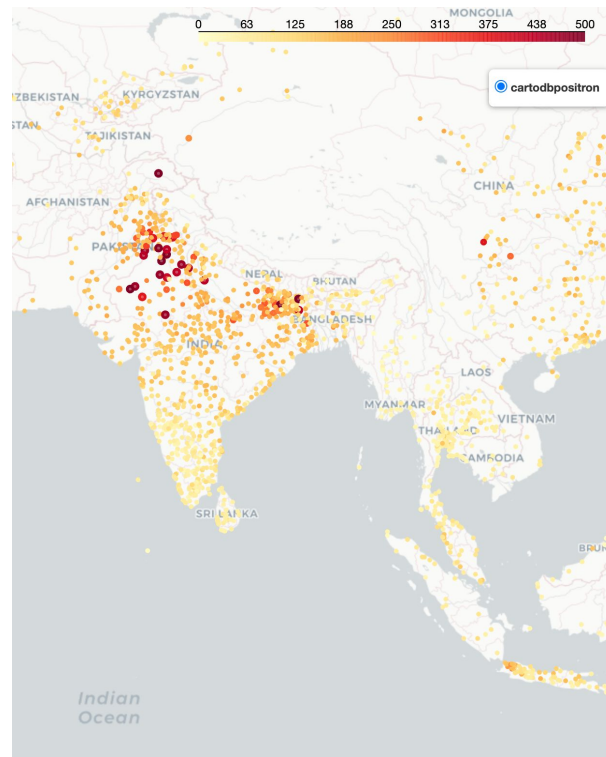


# Visualize on a Map

> Here is a dataset that provides valuable insights into the air quality of different regions, allowing researchers and policymakers to make informed decisions on how to address the issue of air pollution.

## Instructions:

- 1 Upload the dataset and explain that you'd like to visualize on an interactive map.
- 2 Be the eyes of ADA - tell it what you'd like to change, what could be improved.
- 3 Prepare to share back - explaining any problems you worked through.



# Prompt / Refinement Suggestions

A few suggestions for how to refine the visualizations.

- 1 Could we make the bubbles about 5 times their existing size?
- 2 Can you make the background map much more plain/darker/grayscale?
- 3 Can we focus in on [region]?
- 4 What types of visualization would work with this data?
- 5 Consider trying heatmaps, cluster maps, bubble maps.

# LEARN

## **Crafting Insightful Dashboards**



# Principles for Crafting Insightful Dashboards

1. Define Purpose & Know Your Audience
2. Strategic Layout & Visual Hierarchy
3. Real-World & Responsive Design
4. Clarity Through Simplicity
5. Interactive Exploration



# PRACTICE

**Build a Dashboard**



# Getting Practice Data:

## 1. Search:

Use a site like Kaggle to find the data you need.



## 2. Download:


Grab the CSV from the Data Explorer.





## 3. Upload with Context:


Add details from “About Dataset”.


# Kaggle Interface





 Create


 Home


 Competitions


 Datasets


 Models

 Code


 Discussions


 Learn


 More


 Your Work


VIEWED


 World Air Quality Index...

 Supermarket sales

 Productivity and Hourl...

 Airline Baggage Compl...

 Google Trends Data

 Search



SAAD HAROON · UPDATED 19 DAYS AGO

▲ 29

New Notebook

Download (161 kB)



## Coffee Bean Sales Raw Dataset

Comprehensive Coffee Bean Dataset: Orders, Customers, and Products



Data Card

Code (1)

Discussion (0)

Step 3

### About Dataset

*Coffee Bean Sales Dataset - Comprehensive Insights into Coffee Orders, Customers, and Products*

#### Description:

Elevate your data-driven coffee journey with the Coffee Bean Sales Dataset, a treasure trove of information that delves into the world of coffee orders, customer profiles, and an extensive range of coffee products. Whether you're a coffee enthusiast, a data analyst, or a business owner, this dataset provides valuable insights into the coffee industry.

#### Contents:

##### Orders Worksheet:

**Order ID:** A unique identifier for each coffee order.

**Order Date:** The date when the order was placed.

**Customer ID:** An identifier linking the order to a specific customer.

#### Usability ⓘ

7.65

#### License

CC0: Public Domain

#### Expected update frequency

Never

#### Tags

Business

Tabular

Beginner

Exploratory Data Analysis

English

# Tips: Getting from Data to Dashboard



1. After uploading data and EDA, it's time to troubleshoot.
2. ADA tries to use unavailable libraries. Guide it towards **Plotly**.
3. Often it will try to use **Plotly.show()** - this won't work. Inform it of this ahead of time.
4. Normally, it generates the charts as HTML files for you to download and check.
5. After this, it will likely give you an HTML dashboard to download. Tell it that the charts will be in the same folder.



# Build an Interactive Dashboard

> I am going to upload a CSV on the topic of [topic]. Eventually I would like to create an interactive dashboard with at least six insightful charts aimed at [audience]. But first, clean the data and perform some EDA.

## Instructions:

- 1 Find a dataset you'd like to dashboard on [kaggle.com/datasets](https://kaggle.com/datasets)\* and download the CSV(s)
- 2 Upload the CSV(s) using the prompt above 🖱️ (improving as you wish).
- 3 Coax ChatGPT into producing a downloadable HTML dashboard with charts created using **Plotly** - you might have to encourage heavily!



# Prompt / Refinement Suggestions

A few suggestions for how to refine the task if you're encountering problems.

- 1 `.show()` isn't available because your environment is sandboxed.
- 2 Can you use Plotly to generate downloadable versions of those charts?
- 3 Can you combine those charts in a two-column HTML page?
- 4 The HTML files you've already sent will be in the same folder.
- 5 I'd like to combine these into an interactive dashboard, perhaps one that I could host on GitHub Pages?
- 6 Consider the philosophy of Edward Tufte before creating any chart.

# REFLECT

**Data Visualization**



# Reflection: Data Visualization

Taking what you learned and what you practiced, answer the following reflection questions.

- 1 Can you think of a recent project where the data visualization skills you learned today could have made a significant impact?
- 2 What difficulties did you encounter, and how did you overcome them?
- 3 What data visualization project could you initiate next Monday?



## Tips for Reflection:

Think carefully through the questions, provide specific details and examples, and try to break down your thinking.

