

Module 8

Interactive Charts with Plotly

Bringing Code Visualizations to Life inside
Jupyter

Part 1: Static vs. Interactive

Moving Beyond Flat PNG

Bitmaps

Static vs. Interactive Plots



Static (Matplotlib/Seaborn)

Renders as a flat image embedded within your notebook environment. No hover interaction, cannot change zoom boundaries after rendering, and label overlaps are hard to resolve dynamically.



Interactive (Plotly Express)

Builds dynamic HTML/JS-based charts straight inside Jupyter. Allows full zoom-in frames, drag-panning, dynamic hover tooltips, and interactive legends that hide data on-click.

Exploring Data in Real-Time

Dynamic Exploration

Plotly translates complex multi-dimensional datasets into fluid web layers, letting data professionals drill down into individual outlier records with a simple hover gesture.

By bypassing the limits of 2D coordinates, students and analysts can discover unexpected global relationships and anomalies in seconds.



Part 2: Dynamic Geoplots

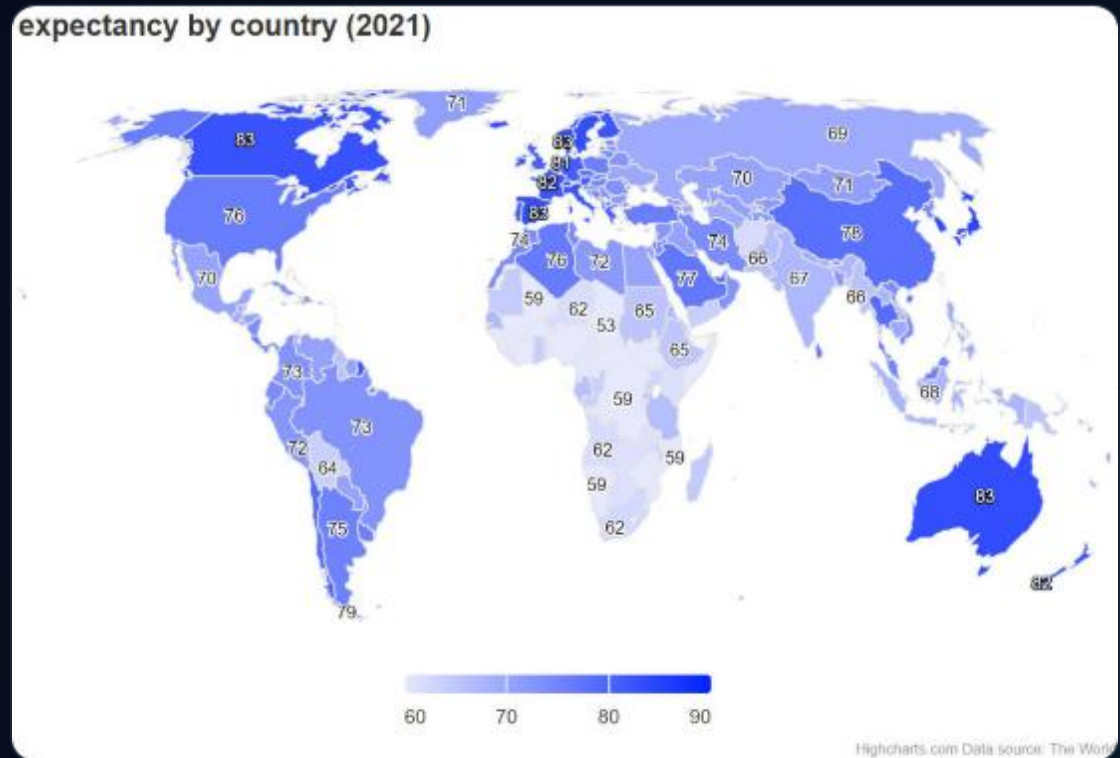
Visualizing Global Datasets Over Real Spatial
Maps

Spatial Mapping in Code

Mapping via Names and ISO Codes

Plotly maps can be constructed in just two lines of Python code, mapping raw columns to geographic systems directly.

- ✓ **ISO-Alpha-3 Mapping:** Maps unique regional keys (like USA, GBR, MYS) directly to land vectors.
- ✓ **Latitude & Longitude Coordinates:** Scatter-maps individual city coordinates onto maps.
- ✓ **Integrated Hover Cards:** Highlights localized attributes instantly during hover actions.
- ✓ **Choropleth Visual Fill:** Fills complete countries using color scales reflecting variable strengths.



Highcharts.com Data source: The World

Part 3: Resolving Dependencies

Handling Missing Packages and Environment
Settings

| Handling Installation Errors



The Missing Error

Encountering a
ModuleNotFoundError: No
module named 'plotly'
exception is a normal part of
notebook setups.



Environment Pip

Safely run `%pip install plotly`.
Using `%pip` instead of `!pip`
targets the exact active kernel
env.



Safe Conda Resolves

Under Anaconda paths,
`%conda install plotly` ensures
your conda package index
updates and tracks your target
path cleanly.

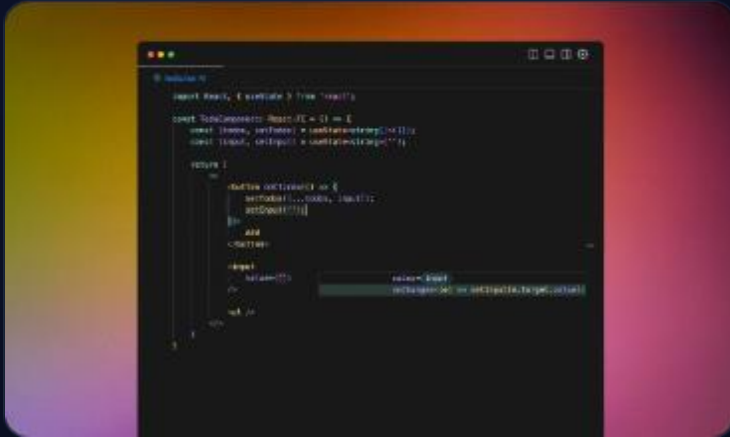
Notebook Package Management

Syntax Type	Preferred Command	Environment Scope Targeted	Avoid This Pitfall
Pip Standard	%pip install plotly	Active Jupyter Kernel Space	Avoid !pip install (installs outside active paths)
Conda Standard	%conda install plotly	Active Conda Virtual Environment	Avoid !conda install (risks freezing base paths)
Jupyter Widgets	%pip install "ipywidgets>=7.5"	Notebook Rendering Layouts	Plotly figures failing to show empty gray blocks

Part 4: Hands-On Exercise

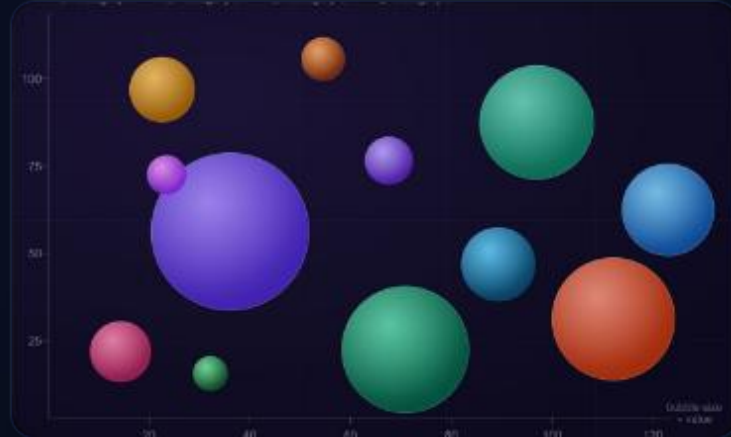
Coding and Interacting with the Gapminder
Dataset

Interactive Scatter Plot Guide



Step 1: Get the Data. Import Plotly Express and load the built-in Gapminder dataset using:

```
px.data.gapminder().
```



Step 2: Plot the Metrics. Build a scatter plot relating GDP per Capita to Life Expectancy, sizing dots by population.



Step 3: Play with Filters. Use zoom boundaries to explore clusters, hover to identify country names, and toggle continents inside the legend.

Questions?

Interactive Plotting inside Jupyter Notebooks

Access the official open-source repository and tutorials:



github.com/plotly/plotly.py | plotly.com/python

Image Sources



<https://www.fusioncharts.com/blog/wp-content/uploads/2026/05/Top-Data-Visualization-Tools-for-2026-450x253.webp>

Source: www.fusioncharts.com



<https://wp-assets.highcharts.com/www-highcharts-com/blog/wp-content/uploads/2024/08/27144458/Choropleth-map-examples-using-Highcharts.jpg>

Source: www.highcharts.com



https://miro.medium.com/v2/resize:fit:2000/1*hyg7ylr75eKx3xiyXTpU-Q.png

Source: itnext.io



<https://wpdatatables.com/wp-content/uploads/2024/01/bubble-charts-ft.jpg>

Source: wpdatatables.com



<https://images.presentationgo.com/2025/10/futuristic-touchscreen-interaction.jpg>

Source: www.presentationgo.com