Power BI : Maps, Web Scraping & Visuals

1. Introduction

This report documents the steps I followed to prepare data (including web scraping), load it into Power BI, and create several map-based visuals and scatter plots. Screenshots of the Power BI pages are included.

2. Data Sources & Web Scraping

Data source used:
- World Happiness Report / country indicators dataset (example).

Web scraping steps performed (high-level):

Step 1: Identify target webpage(s) — Found the table or CSV/HTML page containing country-level metrics (GDP per capita, Score, Social support, Healthy life expectancy, Overall rank).

Step 2: Write a Python scraping script — Used requests to fetch the page and BeautifulSoup to parse the HTML (or pandas.read_html for tables). Example libraries: requests, BeautifulSoup (bs4), pandas.

Step 3: Extract table and clean data — Converted the table to a pandas DataFrame, renamed columns, converted numeric columns, handled missing values, and standardized country names when needed.

Step 4: Save cleaned data — Saved cleaned DataFrame to CSV (e.g., 'wh_report_clean.csv') and verified contents.

Step 5: Load into Power BI — In Power BI Desktop: Home → Get data → Text/CSV (or Excel) → Select file → Transform Data if needed → Close & Apply.

3. Power BI – Data Preparation (Power Query)

Once the CSV/Excel was loaded into Power BI, I used Power Query to ensure the dataset was ready for visualization:
- Checked and set data types (text, decimal number, whole number, date).
- Removed duplicate rows and unnecessary columns.
- Trimmed whitespace and standardized country names to match Power BI map recognizers.
- Created calculated columns or measures where necessary (e.g., GDP per capita per country, Rank measures).
- Applied changes (Close & Apply).

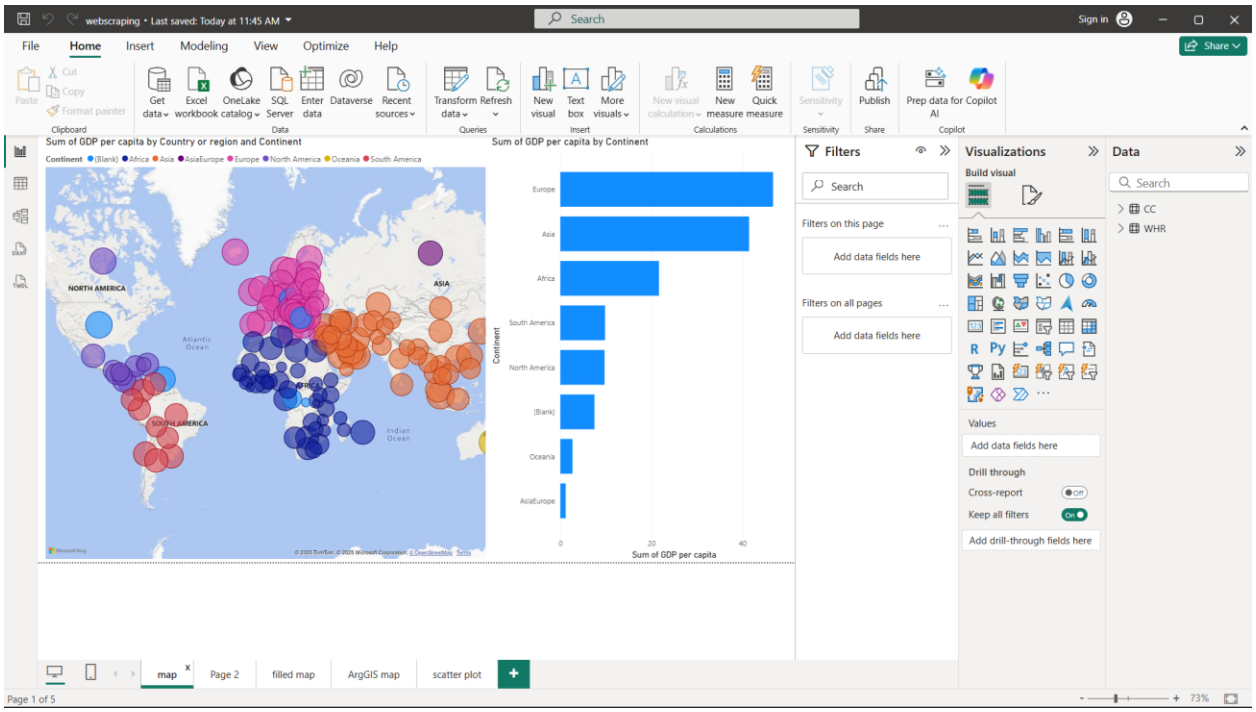
4. Visuals Created in Power BI (step-by-step)

4.1 Bubble Map (Map visual)

Purpose: Show country locations with bubble sizes representing GDP per capita and bubble color by Continent.

Steps in Power BI Desktop:
1. Home → Get Data → (CSV/Excel) → Load data.
2. In Fields pane, expand the dataset and drag 'Country or region' to the Location field of the Map visual.
3. Drag 'GDP per capita' (or Sum of GDP per capita) to Size.
4. Drag 'Continent' to Legend to color bubbles by continent.
5. Optionally, drag 'Country or region' or 'GDP per capita' to Tooltip for hover details.
6. Use the Format pane to adjust bubble size, map style, zoom controls, and title.

Bubble Map

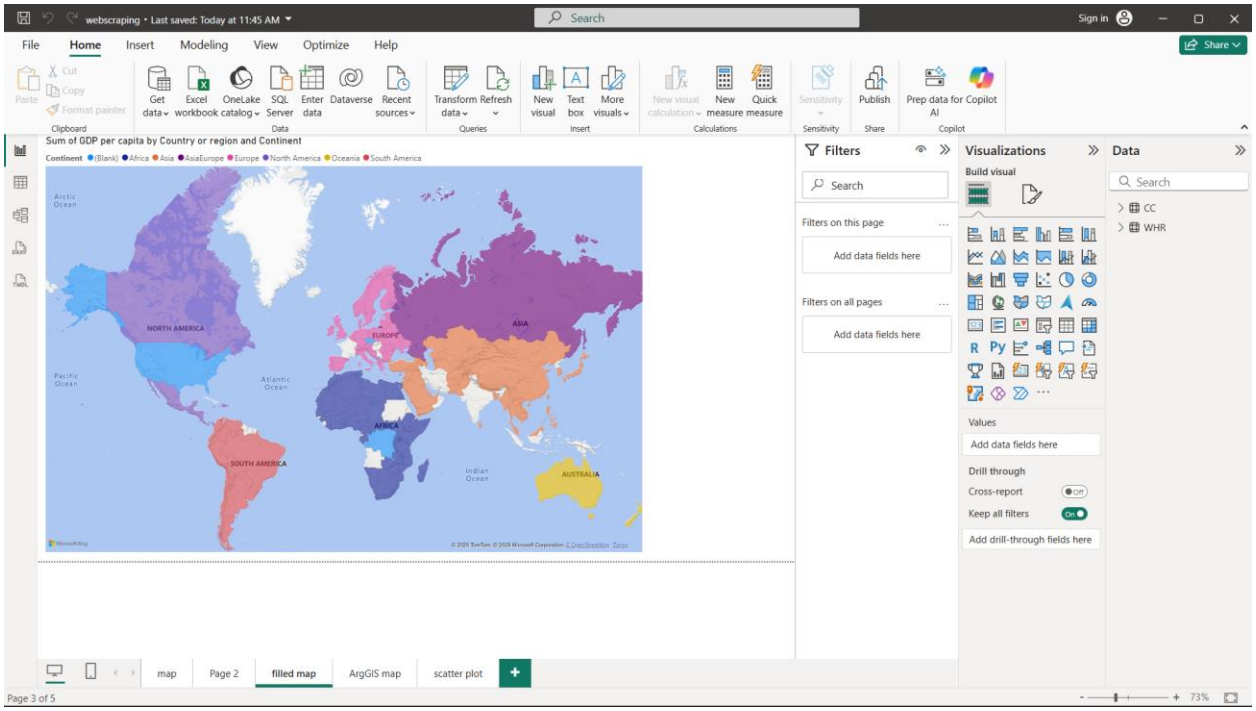


4.2 Filled Map

Purpose: Color entire countries by a measure (e.g., Sum of GDP per capita or Continent categories).

Steps:
1. From Visualizations, select the Filled Map visual.
2. Drag 'Country or region' to Location.
3. Drag the metric (e.g., 'Sum of GDP per capita' or a categorical 'Continent') to Values or Legend.
4. Use the Format pane to change color gradients (Data colors), turn off/on map labels, and set title.

Filled Map

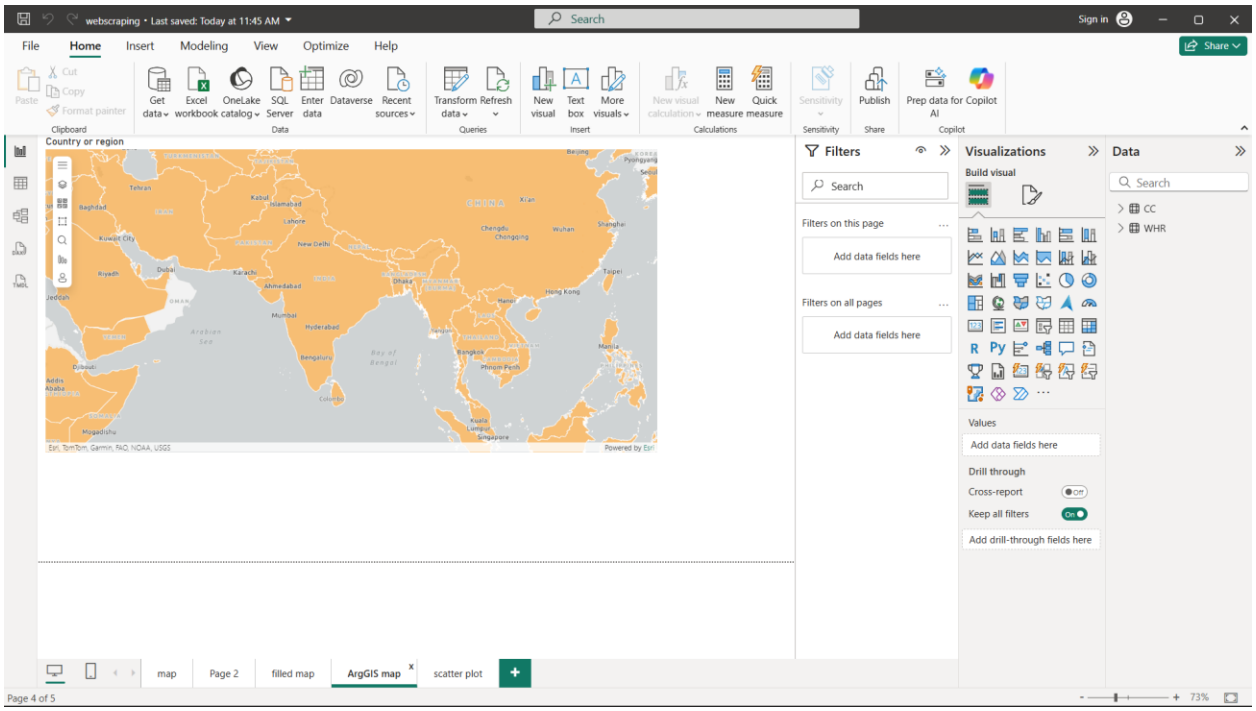


4.3 ArcGIS Map

Purpose: Use ArcGIS maps for richer basemaps and spatial analysis (requires ArcGIS visual in Power BI).

Steps:
1. In Visualizations, choose the ArcGIS Map visual (ArcGIS for Power BI).
2. Drag 'Country or region' to Location (or use latitude/longitude fields if available).
3. Configure layers: choose 'Reference layers' or 'Heat map' as needed.
4. Use the built-in basemap selector, adjust zoom, and styling in ESRI/ArcGIS options.
5. Format labels and tooltips in the Format pane.

Screenshot: ArcGIS Map

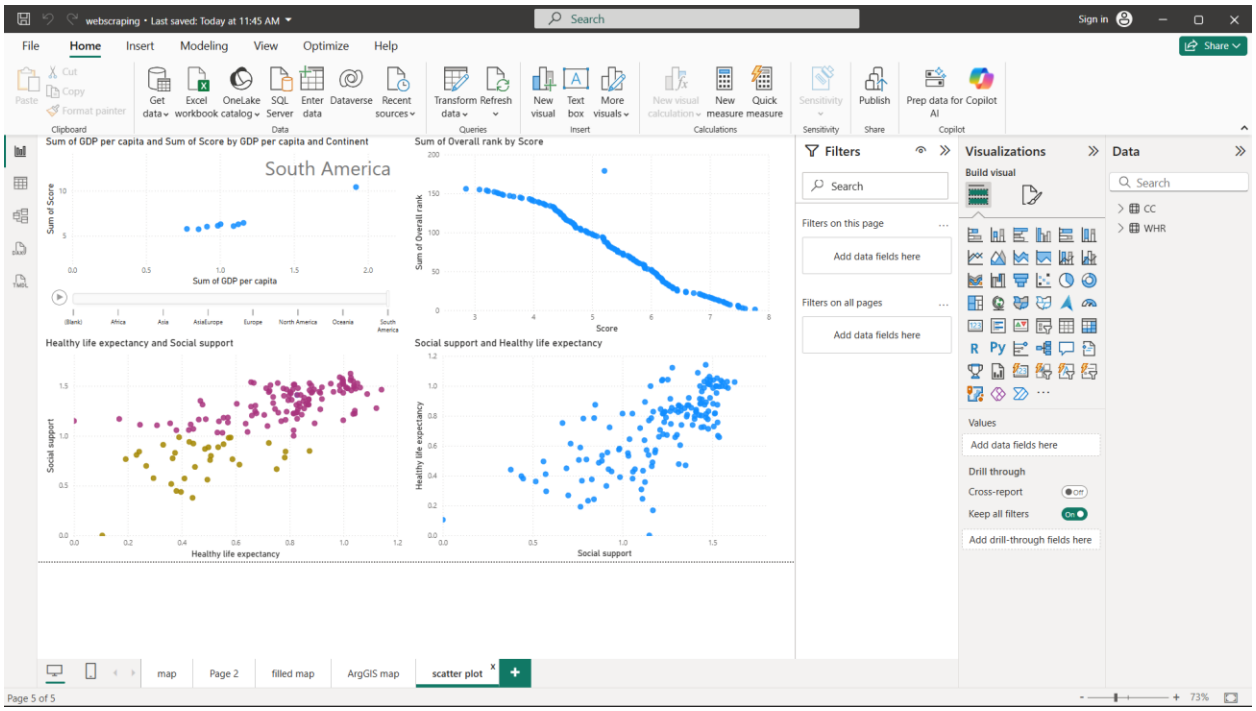


4.4 Scatter Plots & Analysis

Purpose: Show relationships between variables such as GDP per capita vs Score, Social support vs Healthy life expectancy, and overall rank trends.

Steps (example scatter plot):
1. Select Scatter chart visual from Visualizations.
2. Drag 'GDP per capita' to X Axis and 'Score' (or 'Sum of Score') to Y Axis.
3. Drag 'Country or region' to Details, and use 'Continent' as Legend to color by region.
4. Use 'Size' for another numeric to make a bubble chart (optional).
5. Format axes, markers, and add a slicer for continent or filters as needed.

Screenshot: Scatter Plots and Analysis



5. Slicers & Interactivity

I added slicers to make the report interactive. Examples of slicers used:
- Country (single or multi-select)
- Continent
- Date (if time series data available)

Steps to add a slicer:
1. From Visualizations, choose the Slicer visual.
2. Drag the chosen field (e.g., 'Country' or 'Continent') into the Field well.
3. Format slicer orientation (horizontal, vertical) and selection settings (single select, multi-select, between for dates).
4. Use Sync slicers across pages if you want the same filter on multiple report pages (View → Sync slicers).

6. Formatting & Final Touches

- Use the Format pane for each visual to set titles, labels, legend positions, and font sizes.
- Add a report-level theme or custom colors for consistency (View → Themes).
- Add descriptive titles and use text boxes to explain visual insights.
- Use Bookmarks and Buttons if you want to create guided navigation through the report.