Chapter-15 Creating Geo Charts (Map) in Power BI

A **Geo Chart** or **Map** in Power BI visualizes data points based on geographical locations like countries, regions, cities, or latitude and longitude coordinates. These maps help to analyze geographical patterns and relationships within your data, making it easier to spot trends and insights across different geographic regions.

When to Use a Geo Chart

1. **Visualizing Data by Location**
   - Show how data varies across different geographic areas (e.g., sales by country, revenue by city).
2. **Identifying Geospatial Trends**
   - Identify trends, clusters, or outliers based on geographic regions.
3. **Mapping Point Data**
   - Plot specific data points on a map (e.g., store locations, delivery routes, etc.).

Types of Maps in Power BI

1. **Basic Map**
   - Visualize data based on a geographic field (e.g., country, city). Data points are represented as bubbles on the map.
2. **Filled Map**
   - Color-coded areas on the map (e.g., countries, states, regions) represent values, with color intensity showing value differences.
3. **Shape Map**
   - A map that uses custom geographic regions, often in the form of polygons (like regions, counties, or districts).
4. **ArcGIS Map** (requires Power BI Pro)
   - A more advanced mapping tool that provides access to ArcGIS for spatial analysis, available with Power BI Pro.

Steps to Create a Geo Chart (Map) in Power BI

Step 1: Import Your Data

Ensure your dataset includes location-based fields such as:

- **Country**
- **Region**
- **City**
- **Latitude and Longitude**
- **Postal Code**

Example dataset:

City	Sales	Latitude	Longitude
New York	5000	40.7128	-74.0060
London	4000	51.5074	-0.1278
Tokyo	6000	35.6762	139.6503
New Delhi	8000	20.5937	78.9629

Step 2: Create a Map

1. **Select the Map Visual**
   - In the **Visualizations** pane, click on the **Map** visual icon (it looks like a globe).
2. **Assign Data Fields**
   - Drag and drop location-based fields (e.g., **City**, **Country**, or **Latitude/Longitude**) to the **Location** field well in the Map visual.
   - Drag a **Value** field (e.g., **Sales**) to the **Size** or **Color saturation** field well to control the size of the bubbles or color intensity.
   - Optionally, add a **Tooltips** field to show additional information when you hover over a point on the map.

Step 3: Customize the Map

1. **Format the Map**
   - o Click the **Format** pane (paint roller icon) to customize the map's appearance.
   - o **Map Styles**: Choose between different map styles (road, aerial, grayscale).
   - o **Data colors**: Set color gradients for the data points based on value.
   - o **Bubble Size**: Adjust the size of the bubbles to make larger values more prominent.
   - o **Zoom and Centering**: Adjust the zoom level or center the map on a specific region.
2. **Add Map Elements**
   - o **Title**: Set a clear and descriptive title.
   - o **Legend**: Enable a legend to display the color scheme used in the map.
   - o **Data Labels**: Show data labels on the map for better clarity.

Step 4: Adjust the Map for Interactivity

1. **Enable Drill-through**
   - o Allow users to drill through the map to get more details when they click on a data point.
2. **Add Slicers**
   - o Add slicers to filter data by regions, categories, or time periods, making the map interactive.
3. **Geocoding**
   - o Power BI will automatically recognize most geographical fields (like **City**, **Country**, or **Postal Code**) and plot them accurately on the map. However, for **Latitude** and **Longitude**, make sure they are formatted as numeric fields.

Example: Sales by City Map

Dataset:

City	Sales	Latitude	Longitude
New York	5000	40.7128	-74.0060
London	4000	51.5074	-0.1278
Tokyo	6000	35.6762	139.6503

1. Create a **Map** visual on the canvas.
2. Drag the **City** field to the **Location** section.
3. Drag the **Sales** field to the **Size** section (this will adjust bubble size based on sales).
4. Optionally, drag **Sales** to the **Color saturation** field to color-code the bubbles.
5. Customize the map to show different styles, adjust the zoom level, and change data point colors for clarity.

Result:

- The map will display bubbles representing each city, with the size of the bubble corresponding to the sales value, and the color indicating the sales intensity.

Best Practices for Geo Charts in Power BI

1. **Use Meaningful Geographical Data**
   - Ensure the location data is accurate and well-structured (e.g., cities, regions, or correct latitude/longitude values).
2. **Keep the Map Simple**
   - Avoid cluttering the map with too much data. Focus on key locations or values to prevent confusion.
3. **Control the Size and Color of Data Points**
   - Use bubble size to indicate magnitude (e.g., sales volume), and color saturation to reflect value ranges (e.g., revenue levels).
4. **Enable Interactivity**
   - Allow users to click on locations for more details (drill-through) or use slicers to filter data dynamically.
5. **Limit Geographical Scope**
   - If your dataset includes global data, consider zooming into specific regions or countries for better visualization.

Troubleshooting Common Issues

1. **Incorrect Geocoding**
   - Power BI may not recognize certain location names or might misinterpret them. Use **Latitude and Longitude** for more accurate plotting.
2. **Cluttered Map**
   - If you have too many data points, the map can look cluttered. Use filters or slicers to limit the data displayed or break the data into smaller geographical regions.
3. **Map Not Displaying Properly**
   - Ensure that the location data is clean and consistent. Verify that Power BI recognizes the geographical field type correctly.

Advanced: Custom Shape Maps

If your dataset includes custom regions (e.g., counties, districts), you can use a **Shape Map** in Power BI.

1. **Enable Shape Maps**
   - Go to **Options** → **Preview features** → Enable Shape maps.
2. **Add Shape Map Visual**
   - In the Visualizations pane, select the **Shape Map** icon.
3. **Upload Custom Shape File**
   - Upload a custom **GeoJSON** file containing your specific regions.
4. **Assign Data to Shape Map**
   - Map the custom regions to your data points to create a filled map with your custom shapes.