Lesson 17 – Working with Maps & Geocoding, Formatting & Annotations with practical, ready-to-use steps and DAX.

Assumptions (rename if needed)

Table: SalesGeo from sales_with_geodata.csv

Columns: Country, Region (State/Province), City, Latitude, Longitude, SalesAmount, Category, OrderID, CustomerID, Date (optional)

Part 0 — Data prep (5 quick checks)

Data types & categories

Set Data type:

SalesAmount → Decimal/Fixed

Latitude/Longitude → Decimal

Country, Region, City, Category → Text

Set Data category:

Country → Country/Region

Region → State or Province

City → City

Latitude → Latitude

Longitude → Longitude

(Optional) Composite location helper – avoids ambiguous geocoding for repeated city names:

```
Location (City, Region, Country) =
SalesGeo[City] & ", " & SalesGeo[Region] & ", " & SalesGeo[Country]
```

Base measures

```
Total Sales := SUM ( SalesGeo[SalesAmount] )
Orders Count := DISTINCTCOUNT ( SalesGeo[OrderID] )
```

Customers Count := DISTINCTCOUNT (SalesGeo[CustomerID])

Part 1 — Maps & Geocoding
Task 1: Basic Map — Sales by Country

Visual: Map (or Azure Maps)

Location: Country

Bubble size: [Total Sales]

Tooltip: [Total Sales], [Orders Count], [Customers Count]

Data colors: a single color (format later in Task 6)

Task 2: Latitude/Longitude for precise mapping

Visual: Map/Azure Maps

Latitude: Latitude

Longitude: Longitude

Category/Legend (optional): Category

Size: [Total Sales]

Tooltip: [Total Sales], Location (City, Region, Country)

Using Lat/Long forces exact placement and avoids name ambiguity.

Task 3: Plot Total Sales by City

Visual: Map (bubble)

Location: Location (City, Region, Country) (or City with Country in Category)

Size: [Total Sales]

Tooltip: City, Region, Country, [Total Sales], [Orders Count]

Task 4: Region-wise Sales Heatmap (Shape Map)

Visual: Shape map

Location: Region (States/Provinces)

Color saturation: [Total Sales]

Category (optional): Country (filter)

Format → Data colors → Diverging scale (light–to–dark)

If Shape Map is disabled, turn it on in Options → Preview features (then restart PBI). Use a built-in map or an appropriate TopoJSON (for your country/regions).

Task 5: Drill-down Country → Region → City

Hierarchy: Country > Region > City

In the map visual, drag all three into Location well to create the hierarchy.

Turn on Drill mode (down arrow icon).

Users can click a country to drill to its regions, then to cities.

Part 2 — Formatting & Annotations
Task 6: Customize map titles, colors, labels

Visual → Format:

Title: “Sales by Country” (dynamic optional below)

Data colors: choose brand palette; set Transparency ~ 25–35% (helps overlap)

Category labels: On (for cities) but keep small; avoid clutter by using Zoom buttons and Bubble size caps

(Optional) Dynamic title

```
Title – Sales Map :=
VAR selCat = SELECTEDVALUE ( SalesGeo[Category], "All Categories" )
RETURN "Sales by Country — " & selCat
```

Set this measure as the Title text (fx) → Field value.

Task 7: Conditional formatting for bubble colors

Make a color measure that returns a hex code based on sales buckets.

```
Sales Bucket Color :=
VAR s = [Total Sales]
RETURN
   SWITCH (
      TRUE(),
      ISBLANK(s), "#C8C8C8",      -- grey for blank
      s >= 1e7,  "#8B0000",       -- dark red (very high)
      s >= 5e6,  "#D7301F",       -- red
      s >= 1e6,  "#FC8D59",       -- orange
      s >= 2e5,  "#FEE090",       -- light orange
            "#FFFFCC"          -- pale yellow (low)
   )
```

Format → Data colors → fx → Format style: Field value → Based on field: Sales Bucket Color.

Task 8: Annotations to highlight key cities

Option A (Manual): Insert → Shapes/Text box → add arrows/labels near key points; group them; set background transparent.

Option B (Data-driven label): show label only for Top N cities.

```
Top City Rank :=
RANKX (
   ALL ( SalesGeo[City], SalesGeo[Country], SalesGeo[Region] ),
   [Total Sales],
   ,
   DESC,
   DENSE
)
```

```
Show Label (Top 10) :=
IF ( [Top City Rank] <= 10, 1, 0 )
```

Then use a city table visual for labels or data label field (Azure Maps supports label layers). You can filter the bubble map to [Show Label (Top 10)] = 1 in a secondary map, or use report bookmarks to toggle a “highlight layer.”

Task 9: Tooltip page with detailed info

New page → Page information → Tooltip = On; Canvas size = Tooltip.

Add Card visuals: City, Region, Country, [Total Sales], [Orders Count], [Customers Count].

(Optional) add a small bar of Sales by Category for that point.

Name page: TT – Map Details.

On the map visual → Format → Tooltip → Report page → choose TT – Map Details.

Task 10: Slicer to filter map by Category

Add Slicer with SalesGeo[Category].

Consider enabling Search and Multi-select.

Sync slicer across map pages (View → Sync slicers).

Extra: Monthly drill-down using Date

If your dataset has Date, add a proper Date table and relate SalesGeo[Date] → Date[Date].

Use a bar/column with Axis: Date[Year] → drill to Date[Month], Values: [Total Sales].

(Optional) More dynamic color using quantiles

This rescales colors per selection instead of fixed thresholds.

```
Sales Quantile Color :=
VAR s    = [Total Sales]
VAR setX = SUMMARIZE ( ALLSELECTED ( SalesGeo ), SalesGeo[City], "v", [Total Sales] )
VAR p20  = PERCENTILEX.INC ( setX, [v], 0.2 )
VAR p40  = PERCENTILEX.INC ( setX, [v], 0.4 )
VAR p60  = PERCENTILEX.INC ( setX, [v], 0.6 )
VAR p80  = PERCENTILEX.INC ( setX, [v], 0.8 )
RETURN
   SWITCH (
      TRUE(),
      ISBLANK(s), "#C8C8C8",
      s <= p20,  "#d4eeff",
```

```
    s <= p40,  "#92c5de",
    s <= p60,  "#4393c3",
    s <= p80,  "#2166ac",
          "#053061"
)
```

Then use it in Data colors (field value) the same way.