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Exercise No: Lab Assignment-7

Basic Map Charts and Custom territories

Basic Map Charts

Map charts are powerful visualization tools in Tableau that display data geographically using coordinates, geographic roles, or built-in geocoding. They allow us to visualize spatial patterns, regional distributions, and location-based insights. Tableau supports various map types including filled maps, symbol maps, and density maps, making it easy to identify geographic trends and hotspots in data.

In this task, map charts help us visualize air quality patterns across different locations, identify pollution hotspots, and understand regional variations in pollutant concentrations.

Custom Territories

Custom territories in Tableau allow users to create their own geographic groupings that may not exist in standard administrative boundaries. This feature enables the creation of meaningful regional clusters based on business logic, pollution levels, or other criteria. Custom territories can be created by grouping states, cities, or other geographic entities to analyse data at a customized regional level.

In this task, custom territories help us group monitoring stations or cities based on pollution severity levels, creating meaningful zones for air quality management and policy implementation.

Air Quality Index (AQI) Dataset

About Dataset

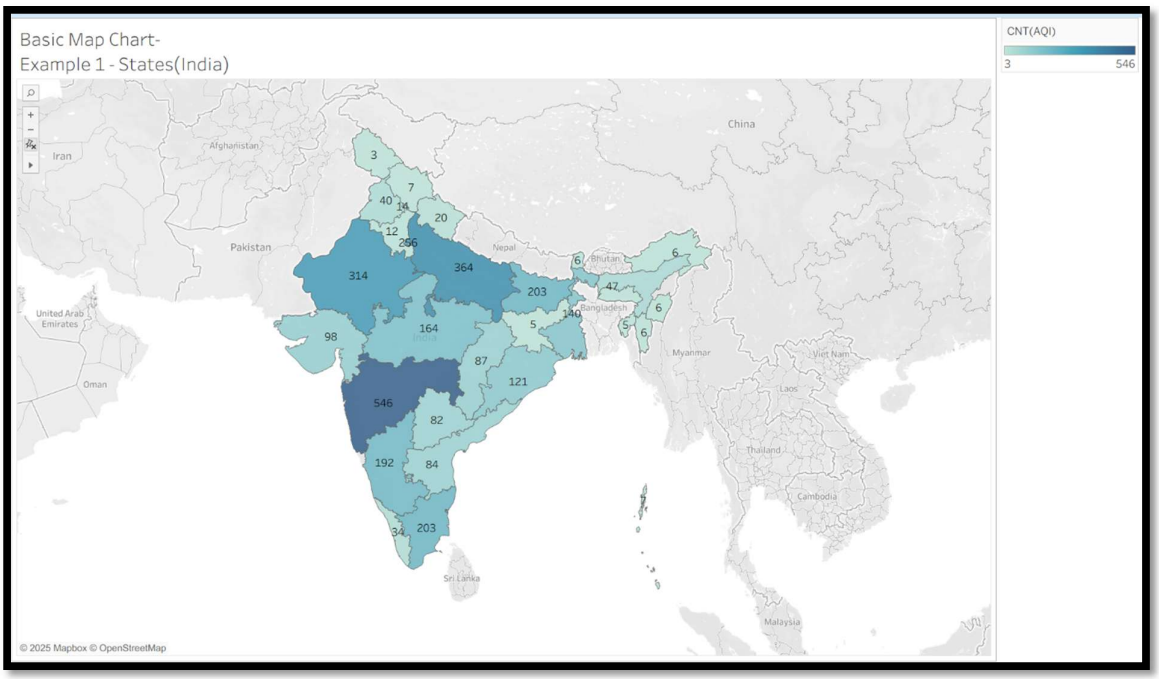
The dataset provides air quality monitoring data from various stations across multiple cities and states. It includes pollutant concentration levels such as Ozone (O_3), PM2.5, NO_2, SO_2, and PM10, along with geographical coordinates and timestamps. Each entry records the minimum, maximum, and average pollutant levels at a given time. The data helps analyse pollution trends, identify hotspots, and support environmental policies. It is collected from government agencies and public monitoring networks using real-time sensors. The dataset is valuable for researchers, policymakers, and environmentalists studying air pollution, public health impacts, and climate change mitigation strategies.

Dataset Structure

country	Name of the country where the monitoring station is located (Categorical)
state	The state within the country (Categorical)
city	The specific city where air quality is measured (Categorical)
station	The name of the monitoring station (Categorical)
last_update	Timestamp of the most recent update in the dataset (Date/Time)
latitude	Latitude of the monitoring station (Numerical)
longitude	Longitude of the monitoring station (Numerical)
pollutant_id	Type of pollutant being monitored (e.g., OZONE, PM2.5, NO2) (Categorical)
pollutant_min	Minimum recorded level of the pollutant (Numerical)
pollutant_max	Maximum recorded level of the pollutant (Numerical)
pollutant_avg	Average level of the pollutant (Numerical)

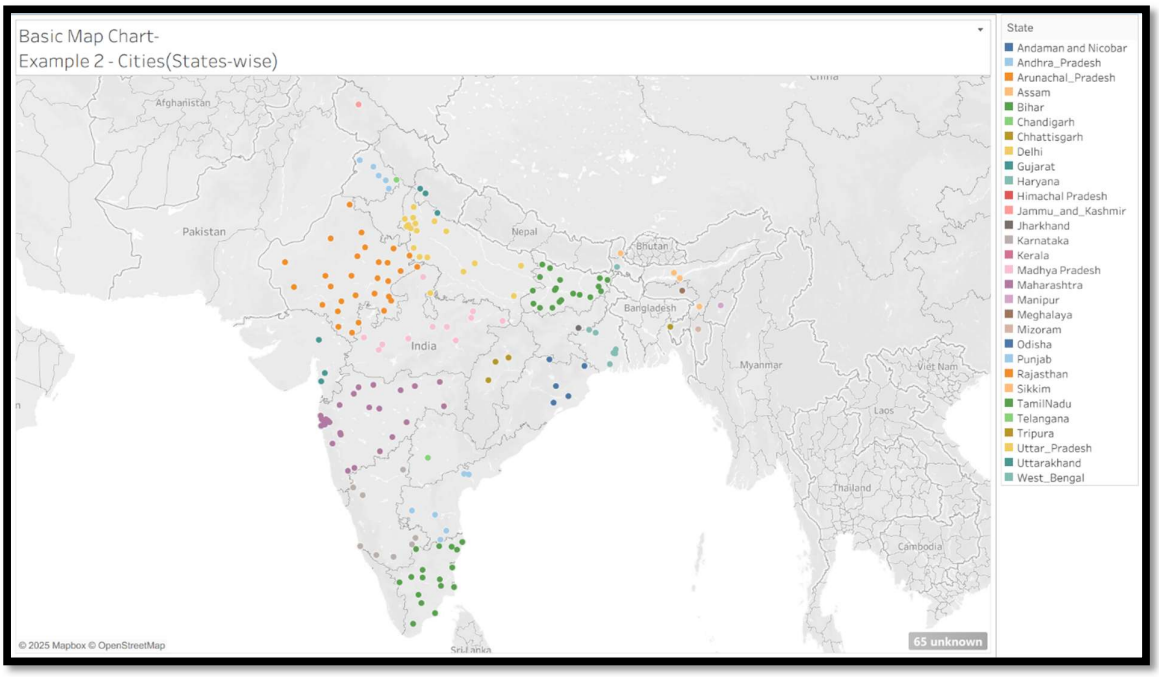
🔷 Basic Map Charts

Map Chart 1: Air Quality Index (AQI) Count by States (India)



The choropleth map displays the count of AQI records across Indian states using a color gradient from light teal to dark blue. Each state is coloured based on the number of air quality monitoring records, with numerical values displayed on each state. The visualization reveals significant variation in monitoring intensity, with some states like Maharashtra showing 546 records (darkest blue) while northeastern states show minimal coverage (3-6 records). The map effectively highlights states with comprehensive air quality monitoring versus those with limited data collection.

Map Chart 2: City-wise Distribution of Monitoring Stations by State



This symbol map displays the distribution of cities with air quality monitoring stations across India, with each point coloured according to its respective state. The legend shows 26+ states including major ones like Maharashtra (purple), Rajasthan (orange), Tamil Nadu (green), Uttar Pradesh (teal), and others. The visualization reveals state-wise clustering patterns, with dense concentrations of monitoring cities in states like Rajasthan (western region), Maharashtra (western-central), and Tamil Nadu (southern region). The color-coding effectively differentiates state boundaries and helps identify which states have comprehensive city-level monitoring networks versus those with sparse coverage.

🔷 Custom Territories

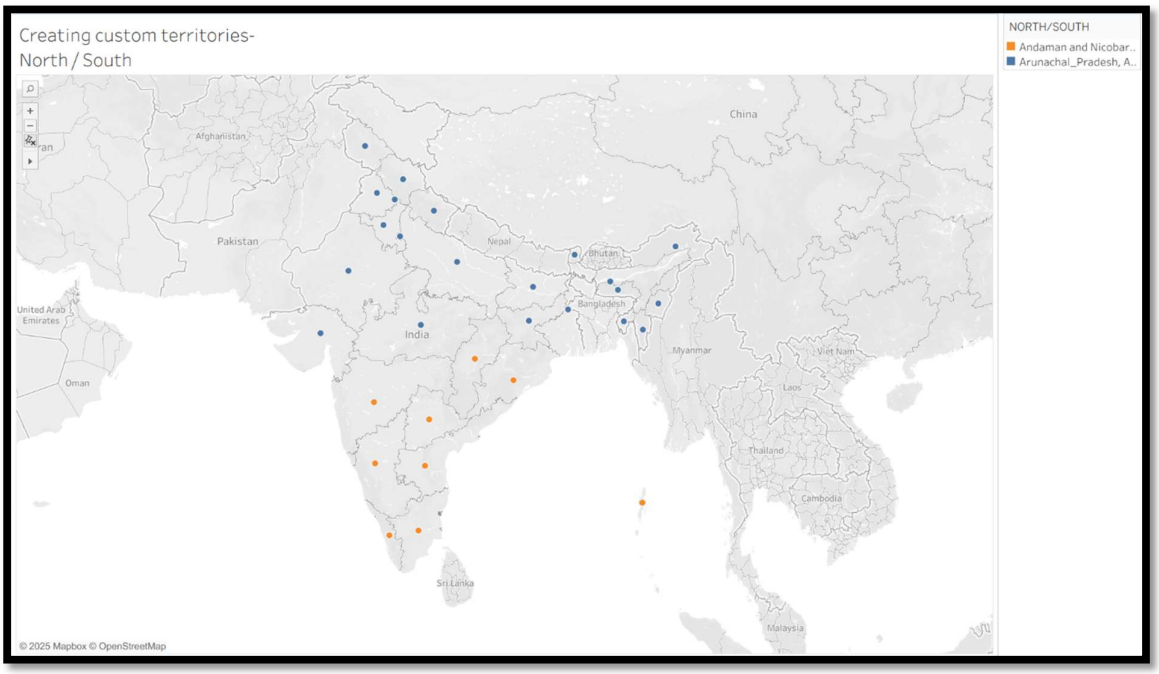
North/South Regional Division

Territory Definition: Grouping states into Northern and Southern regions of India

Categories:

- Northern Region (Blue markers) - includes northern and northeastern states
- Southern Region (Orange markers) - includes southern and some central states

Insight: Regional comparison of air quality monitoring coverage between North and South India



This custom territory map divides India into two major regions using color-coded markers. The Northern territory (blue dots) encompasses the northern plains, northeastern states, and upper regions, showing dense monitoring coverage across the Indo-Gangetic belt and Himalayan foothills. The Southern territory (orange dots) covers peninsular India including southern and some central states. The visualization clearly demonstrates that the Northern region has significantly higher monitoring station density compared to the Southern region, which shows more scattered coverage primarily concentrated in major urban centres.

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