Scenario

A global research institution is studying the impact of climate change across different regions. They need a centralized system to track key climate indicators, monitor extreme weather events, and analyze their economic and infrastructural impact.

Business Problem

The organization faces challenges in:

Tracking Climate Trends – Data is scattered across multiple sources, making it difficult to analyze temperature variations, air quality, and precipitation patterns over time.

Generating Reports Efficiently – Researchers rely on manual reporting, leading to delays in decision-making.

Assessing Climate Risks – There is no structured way to analyze how climate events impact infrastructure and the economy in different regions.

To address these issues, I am going to develop a data-driven climate monitoring solution with automated reporting and real-time visualization, ensuring quick access to insights for informed decision-making.

Climate Change dataset column descriptions:

Metadata Columns:

Record ID

- A unique identifier assigned to each individual climate data record.

Date

- The specific date when the climate observation was recorded.

Geographic Columns:

Country

- The nation where the climate data was collected.

City

- The specific urban location where the data was gathered.

Climate and Environmental Metrics:

Temperature (°C)

- Measurement of the ambient air temperature in degrees Celsius.

Humidity (%)

- The amount of water vapor present in the air, expressed as a percentage.

Precipitation (mm)

- The total amount of rainfall or water equivalent measured in millimeters.

Air Quality Index (AQI)

- A numerical scale that indicates the level of air pollution and potential health risks.

Extreme Weather Events

- Significant and unusual meteorological occurrences such as hurricanes, heatwaves, or droughts.

Classification and Contextual Columns:

Climate Classification (Koeppen)

- A scientific system for categorizing global climate types based on temperature and precipitation patterns.

Climate Zone

- A broad classification of the ecological climate characteristics of a specific region.

Biome Type

- A large-scale biological community is defined by its distinctive plant and animal species and environmental conditions.

Meteorological Columns:

Heat Index

- A combined measure of air temperature and relative humidity represents how hot it actually feels.

Wind Speed

- The rate of air movement measured at the location.

Wind Direction

- The compass direction from which the wind is blowing.

Season

- The specific time of year when the data was collected.

Impact and Vulnerability Columns:

Population Exposure

- The number of people is potentially affected by the observed climate conditions.

Economic Impact Estimate

- A monetary valuation of the potential economic consequences related to climate conditions.

Infrastructure Vulnerability Score

- A numerical rating that assesses the potential risk and susceptibility of infrastructure to climate-related challenges.