**1) Air Quality Index (AQI) Dataset**

**Source:** EPA Air Quality Data

**Description:** This dataset provides daily air quality measurements, including pollutants like PM2.5, PM10, CO, NO2, SO2, and O3, across various U.S. cities.

**Simplified Version:** A subset focusing on a single city over one month, with columns: Date, PM2.5, PM10, CO, NO2, SO2, O3.

**Name of dataset:** Simplified\_AQI\_Dataset.csv

* **PM2.5 (5-50 µg/m³):** Typical range in urban and rural areas (5-12 µg/m³ is considered good, 35+ is unhealthy).
* **PM10 (10-100 µg/m³):** Follows similar real-world observations, with 50+ being moderate to unhealthy.
* **CO (0.1-1.5 ppm):** Matches common atmospheric concentrations; urban areas see ~0.5-1.2 ppm.
* **NO2 (5-50 ppb):** Normal range in cities and industrial regions, with WHO limits below 40 ppb.
* **SO2 (1-20 ppb):** Background SO2 levels are usually <10 ppb, 20 ppb represents moderate pollution.
* **O3 (10-80 ppb):** Ozone levels vary widely, with peaks around 70-80 ppb in polluted regions.

**2) Forest Biodiversity Survey Dataset**

**Source:** Botanic Records from Southwest Ghana

**Description:** Contains records of tree species, their heights, and canopy cover percentages from forest reserves in southwest Ghana.

**Simplified Version:** A selection of 50 records with columns: Species, Tree\_Height\_m, Canopy\_Cover\_%, Latitude, Longitude.

**Name of dataset:** Simplified\_Forest\_Biodiversity\_Dataset.csv

* **Tree Height (5-30 m):** Small trees start at ~5m, large trees in temperate zones reach ~25-30m.
* **Canopy Cover (20-90%):** Open forests have ~20%, while dense forests approach 90%.
* **Latitude/Longitude (-5 to 5 degrees):** A small range simulating a local ecological survey region.

**3) Water Quality Monitoring Dataset**

**Source:** USGS Water Quality Data

**Description:** Provides water quality measurements such as pH, dissolved oxygen, turbidity, and temperature from various monitoring stations.

**Simplified Version:** Data from a single monitoring station over two weeks, with columns: Date, pH, Dissolved\_Oxygen\_mg\_L, Turbidity\_NTU, Temperature\_C.

**Name of dataset:** Simplified\_Water\_Quality\_Dataset.csv

* **pH (6.5-8.5):** Typical pH range for freshwater; neutral is ~7, slightly acidic or alkaline variations occur.
* **Dissolved Oxygen (4-10 mg/L):** Healthy water bodies range from 5-9 mg/L, hypoxic conditions <4 mg/L.
* **Turbidity (0.5-5 NTU):** Clear water <1 NTU, moderately turbid rivers ~2-5 NTU.
* **Temperature (5-25°C):** Freshwater temperatures range from cold mountain streams (~5°C) to warm lakes (~25°C).