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**Assignment No. - 4**

**Problem Statement** : Data Visualization using matplotlib

Problem Statement: Analyzing Air Quality Index (AQI) Trends in a City Dataset: "City\_Air\_Quality.csv" Description: The dataset contains information about air quality measurements in a specific city over a period of time. It includes attributes such as date, time, pollutant levels (e.g., PM2.5, PM10, CO), and the Air Quality Index (AQI) values. The goal is to use the matplotlib library to create visualizations that effectively represent the AQI trends and patterns for different pollutants in the city. Tasks to Perform: 1. Import the "City\_Air\_Quality.csv" dataset. 2. Explore the dataset to understand its structure and content. 3. Identify the relevant variables for visualizing AQI trends, such as date, pollutant levels, and AQI values. 4. Create line plots or time series plots to visualize the overall AQI trend over time. 5. Plot individual pollutant levels (e.g., PM2.5, PM10, CO) on separate line plots to visualize their trends over time. Use bar plots or stacked bar plots to compare the AQI values across different dates or time periods. 7. Create box plots or violin plots to analyze the distribution of AQI values for different pollutant categories. 8. Use scatter plots or bubble charts to explore the relationship between AQI values and pollutant levels. 9. Customize the visualizations by adding labels, titles, legends, and appropriate color Schemes.

CODE:-

import numpy as np

import pandas as pd

import matplotlib.pyplot as plt

data = pd.read\_csv("data.csv",encoding='latin1')

print(data.index)

print(data.isnull().sum())

print(data.shape)

data.info()

print(data.isnull().sum())

data.tail()

state\_means = data.groupby('state')['no2'].mean()

x\_axis = state\_means.index

y\_axis = state\_means.values

plt.figure(figsize=(12, 6))

plt.bar(x\_axis, y\_axis, color='blue')

plt.xlabel('State')

plt.ylabel('Mean NO2 Value')

plt.title('Mean NO2 Values by State')

plt.xticks(rotation=90)

plt.tight\_layout()

plt.show()

state\_means = data.groupby('state')['so2'].mean()

x\_axis = state\_means.index

y\_axis = state\_means.values

plt.figure(figsize=(12, 6))

plt.bar(x\_axis, y\_axis, color='blue')

plt.xlabel('State')

plt.ylabel('Mean SO2 Value')

plt.title('Mean SO2 Values by State')

plt.xticks(rotation=90)

plt.tight\_layout()

plt.show()

OUTPUT:-





  