# Assignment No-5

**CODE:-**

```python
import pandas as pd
import matplotlib.pyplot as plt
import seaborn as sns
from google.colab import files

sns.set(style="whitegrid")

# Upload dataset
uploaded = files.upload()
filename = next(iter(uploaded))
df = pd.read_csv(filename)

print("Columns in dataset:", df.columns.tolist())

# Create datetime column from 'Date'
df['datetime'] = pd.to_datetime(df['Date'])

df = df.sort_values('datetime')

# Set pollutants list based on your columns
pollutants = ['PM2.5', 'PM10', 'CO']  # Add more if you want

# 5. Overall AQI trend over time
plt.figure(figsize=(14,6))
plt.plot(df['datetime'], df['AQI'], label='AQI', color='darkred')
plt.xlabel('Date')
plt.ylabel('AQI')
plt.title('Air Quality Index (AQI) Trend Over Time')
plt.legend()
plt.xticks(rotation=45)
plt.tight_layout()
plt.show()

# 6. Individual pollutant levels over time
plt.figure(figsize=(14,8))
for pollutant in pollutants:
```

```python
    if pollutant in df.columns:
        plt.plot(df['datetime'], df[pollutant], label=pollutant)

plt.xlabel('Date')
plt.ylabel('Pollutant Level')
plt.title('Pollutant Levels Over Time')
plt.legend()
plt.xticks(rotation=45)
plt.tight_layout()
plt.show()

# 7. Bar plot: Average AQI per day (same as daily data so just plot AQI)
plt.figure(figsize=(14,6))
plt.bar(df['datetime'].dt.date.astype(str), df['AQI'], color='teal')
plt.xlabel('Date')
plt.ylabel('AQI')
plt.title('AQI by Date')
plt.xticks(rotation=90)
plt.tight_layout()
plt.show()

# 8. Box plot: AQI distribution by PM2.5 quartiles
df['PM2.5_category'] = pd.qcut(df['PM2.5'], 4, labels=['Low', 'Medium',
'High', 'Very High'])

plt.figure(figsize=(8,6))
sns.boxplot(x='PM2.5_category', y='AQI', data=df, palette="coolwarm")
plt.xlabel('PM2.5 Level Category')
plt.ylabel('AQI')
plt.title('AQI Distribution by PM2.5 Level Category')
plt.show()

# 9. Scatter plots: AQI vs pollutant levels
plt.figure(figsize=(14,5))

for i, pollutant in enumerate(pollutants):
    if pollutant in df.columns:
        plt.subplot(1, len(pollutants), i+1)
        plt.scatter(df[pollutant], df['AQI'], alpha=0.5, color='navy')
        plt.xlabel(pollutant)
```

```python
        plt.ylabel('AQI')
        plt.title(f'AQI vs {pollutant}')

plt.tight_layout()
plt.show()
```

**OUTPUT :–**

## AQI by Date



```
/tmp/ipython-input-2298491583.py:62: FutureWarning:

Passing `palette` without assigning `hue` is deprecated and will be removed in v0.14.0. Assign the `x` variable to `hue` and set `legend=False` for the same effect.

  sns.boxplot(x='PM2.5_category', y='AQI', data=df, palette="coolwarm")
```

## AQI Distribution by PM2.5 Level Category

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## AQI Distribution by PM2.5 Level Category



AQI vs PM2.5        AQI vs PM10        AQI vs CO