# Program:

import pandas as pd import numpy as np

import matplotlib.pyplot as plt import seaborn as sns

data = {

'Date': pd.date\_range(start='2023-01-01', periods=365, freq='D'),

'City': np.random.choice(['Delhi', 'Mumbai', 'Chennai', 'Kolkata', 'Bangalore'], 365), 'State': np.random.choice(['Delhi', 'Maharashtra', 'Tamil Nadu', 'West Bengal',

'Karnataka'], 365),

'Country': 'India',

'MaxTemp': np.random.normal(35, 5, 365),

'MinTemp': np.random.normal(22, 4, 365)

}

df = pd.DataFrame(data) print(df.head())

print(df.info()) print(df.describe())

df['AvgTemp'] = (df['MaxTemp'] + df['MinTemp']) / 2 df['Date'] = pd.to\_datetime(df['Date'])

df = df.dropna()

df = df.drop\_duplicates() df['Year'] = df['Date'].dt.year

df['Month'] = df['Date'].dt.month

df['Day'] = df['Date'].dt.day plt.figure(figsize=(10, 5))

sns.histplot(df['AvgTemp'], kde=True, color='tomato') plt.title("Distribution of Average Temperature") plt.xlabel("Average Temperature (°C)")

plt.show()

monthly\_avg = df.groupby('Month')['AvgTemp'].mean().reset\_index() sns.lineplot(x='Month', y='AvgTemp', data=monthly\_avg) plt.title("Average Monthly Temperature Trend")

plt.xticks(range(1, 13)) plt.show()

top\_cities = df['City'].value\_counts().head(5).index filtered\_df = df[df['City'].isin(top\_cities)]

sns.lineplot(x='Month', y='AvgTemp', hue='City', data=filtered\_df) plt.title("Monthly Avg Temperature in Top Cities")

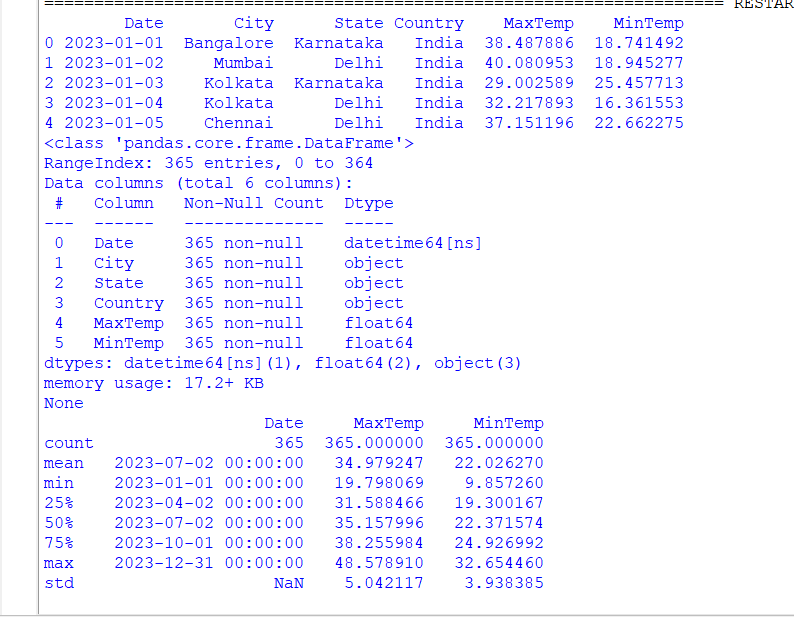
plt.show()

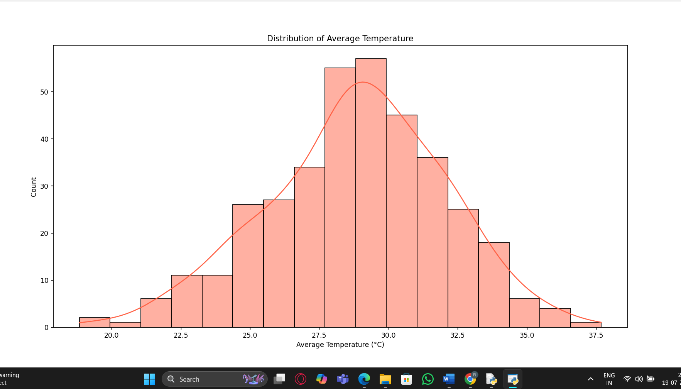
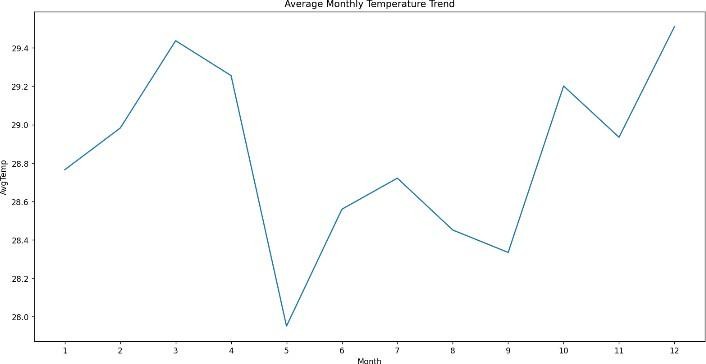
delhi\_df = df[df['State'] == 'Delhi']

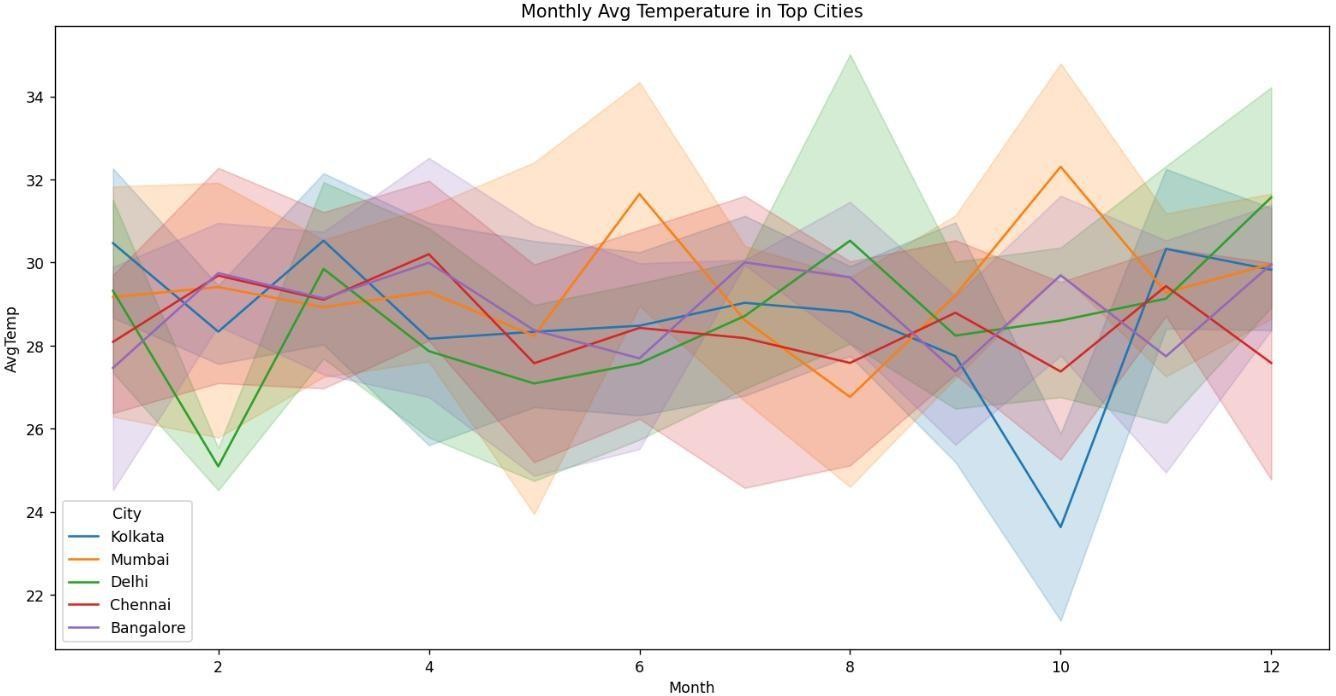
yearly\_trend = delhi\_df.groupby('Year')['AvgTemp'].mean().reset\_index() sns.lineplot(x='Year', y='AvgTemp', data=yearly\_trend) plt.title("Average Yearly Temperature in Delhi")

plt.show()

# Output:

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