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# GDP Forecasting with ARIMA (India, 2013–2023)
import pandas as pd
import matplotlib.pyplot as plt
from statsmodels.tsa.arima.model import ARIMA

# Step 1: Historical GDP growth data (%)
years = list(range(2013, 2024))
growth = [6.4, 7.4, 8.0, 8.3, 6.8, 6.5, 4.2, -5.8, 9.7, 7.0, 7.6]
series = pd.Series(growth, index=pd.Index(years, name='Year'))

# Step 2: Fit ARIMA model
model = ARIMA(series, order=(1,1,1))
model_fit = model.fit()

# Step 3: Forecast next 5 years (2024–2028)
forecast = model_fit.forecast(steps=5)
forecast.index = range(2024, 2029)

# Step 4: Display results
print("☑ Forecasted GDP Growth for 2024–2028:")
print(forecast.round(2))

# Optional: Plot
plt.figure(figsize=(10, 5))
series.plot(label='Historical GDP Growth', marker='o')
forecast.plot(label='Forecasted GDP Growth', marker='o', linestyle='--')
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plt.title("India GDP Growth Forecast (ARIMA)")
plt.ylabel("GDP Growth (%)")
plt.xlabel("Year")
plt.legend()
plt.grid(True)
plt.show()
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