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import yfinance as yf
import pandas as pd
from sklearn.linear_model import LinearRegression
import matplotlib.pyplot as plt

# Step 1: Load historical stock data
stock = yf.download('AAPL', start='2020-01-01', end='2023-12-31')  # Apple stock
data = stock[['Close']].copy()

# Step 2: Prepare data (create day numbers)
data.reset_index(inplace=True)
data['Day'] = data.index  # Simple feature: row number

# Step 3: Split features and target
X = data[['Day']]
y = data['Close']

# Step 4: Train model
model = LinearRegression()
model.fit(X, y)

# Step 5: Predict prices
data['Predicted'] = model.predict(X)

# Step 6: Plot results
plt.figure(figsize=(10, 5))
plt.plot(data['Day'], data['Close'], label='Actual Price')
plt.plot(data['Day'], data['Predicted'], label='Predicted Price', linestyle='--')
plt.xlabel('Days')
plt.ylabel('Price')
plt.title('Simple Stock Price Prediction (AAPL)')
plt.legend()
plt.grid()
plt.show()
```