```python
import yfinance as yf
import pandas as pd
import matplotlib.pyplot as plt
from statsmodels.tsa.stattools import adfuller
from statsmodels.tsa.arima.model import ARIMA
import warnings
warnings.filterwarnings('ignore')

# Step 1: Download Stock Data
data = yf.download('RELIANCE.NS', start='2020-01-01', end='2024-01-01')
data = data[['Close']]
data.dropna(inplace=True)

# Step 2: Visualize
data.plot(title='Reliance Industries - Closing Price')
plt.ylabel('Price (INR)')
plt.show()

# Step 3: ADF Test (Check Stationarity)
result = adfuller(data['Close'])
print('ADF Statistic:', result[0])
print('p-value:', result[1])

# Step 4: Differencing (if not stationary)
data['Diff'] = data['Close'].diff()
data.dropna(inplace=True)

# Step 5: Fit ARIMA Model (Order can be tuned via AIC or auto_arima)
model = ARIMA(data['Close'], order=(5,1,0))  # p=5, d=1, q=0 as example
model_fit = model.fit()
print(model_fit.summary())

# Step 6: Forecast Next 30 Days
forecast = model_fit.forecast(steps=30)

# Step 7: Plot Forecast
plt.figure(figsize=(10, 5))
plt.plot(data['Close'], label='Historical')
plt.plot(pd.date_range(start=data.index[-1], periods=31, freq='D')[1:], forecast, label='Forecast', color='red')
plt.title('Reliance Stock Price Forecast (ARIMA)')
plt.xlabel('Date')
plt.ylabel('Price (INR)')
plt.legend()
plt.grid(True)
plt.show()
```
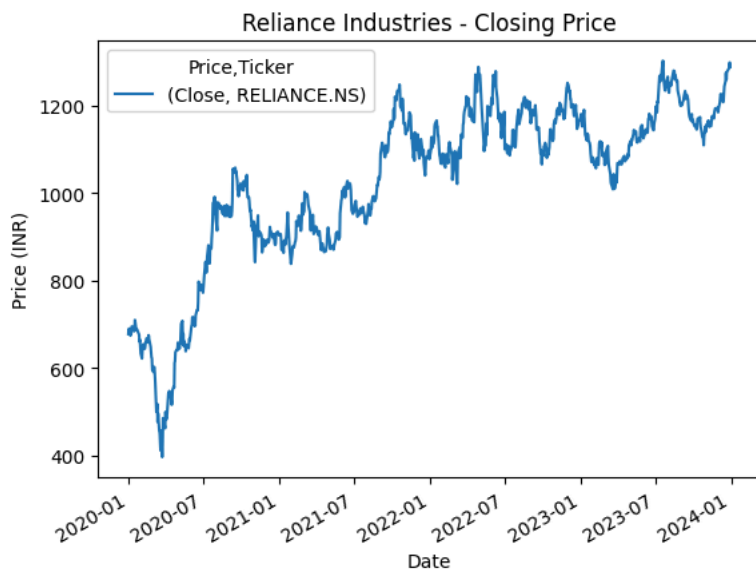
[******************100%**********************] 1 of 1 completed

Reliance Industries - Closing Price


```
ADF Statistic: -1.7106043970970914
p-value: 0.42565722119683336
                              SARIMAX Results
==============================================================================
Dep. Variable:            RELIANCE.NS   No. Observations:               991
Model:                 ARIMA(5, 1, 0)   Log Likelihood            -4211.024
Date:                Thu, 19 Jun 2025   AIC                        8434.048
Time:                        09:57:13   BIC                        8463.434
Sample:                             0   HQIC                       8445.222
                                - 991
Covariance Type:                  opg
==============================================================================
                 coef    std err          z      P>|z|      [0.025      0.975]
------------------------------------------------------------------------------
ar.L1          0.0241      0.031      0.777      0.437      -0.037       0.085
ar.L2          0.0211      0.028      0.753      0.452      -0.034       0.076
ar.L3         -0.0522      0.027     -1.914      0.056      -0.106       0.001
ar.L4         -0.0382      0.030     -1.282      0.200      -0.097       0.020
ar.L5          0.0526      0.031      1.710      0.087      -0.008       0.113
sigma2       289.7986      8.722     33.226      0.000     272.704     306.893
===================================================================================
Ljung-Box (L1) (Q):                   0.01   Jarque-Bera (JB):               285.57
Prob(Q):                              0.94   Prob(JB):                         0.00
Heteroskedasticity (H):               0.50   Skew:                            -0.00
Prob(H) (two-sided):                  0.00   Kurtosis:                         5.63
===================================================================================

Warnings:
[1] Covariance matrix calculated using the outer product of gradients (complex-step).
```

Reliance Stock Price Forecast (ARIMA)