```
# Import the necessary libraries
import pandas as pd
from statsmodels.tsa.stattools import adfuller
from statsmodels.tsa.arima.model import ARIMA
import matplotlib.pyplot as plt
```

```
# Load the data
data = pd.read_csv('/content/KFC Dataset.csv')
data.head()
```

	Date	Open	High	Low	Close	Adj Close	Volume
0	2000-04-14	1080.0	1080.0	1070.0	1070.0	735.970581	9000
1	2000-04-17	1070.0	1070.0	1070.0	1070.0	735.970581	2000
2	2000-04-18	1070.0	1070.0	1070.0	1070.0	735.970581	0
3	2000-04-19	1070.0	1070.0	1070.0	1070.0	735.970581	0
4	2000-04-20	1060.0	1060.0	1060.0	1060.0	729.092407	1000

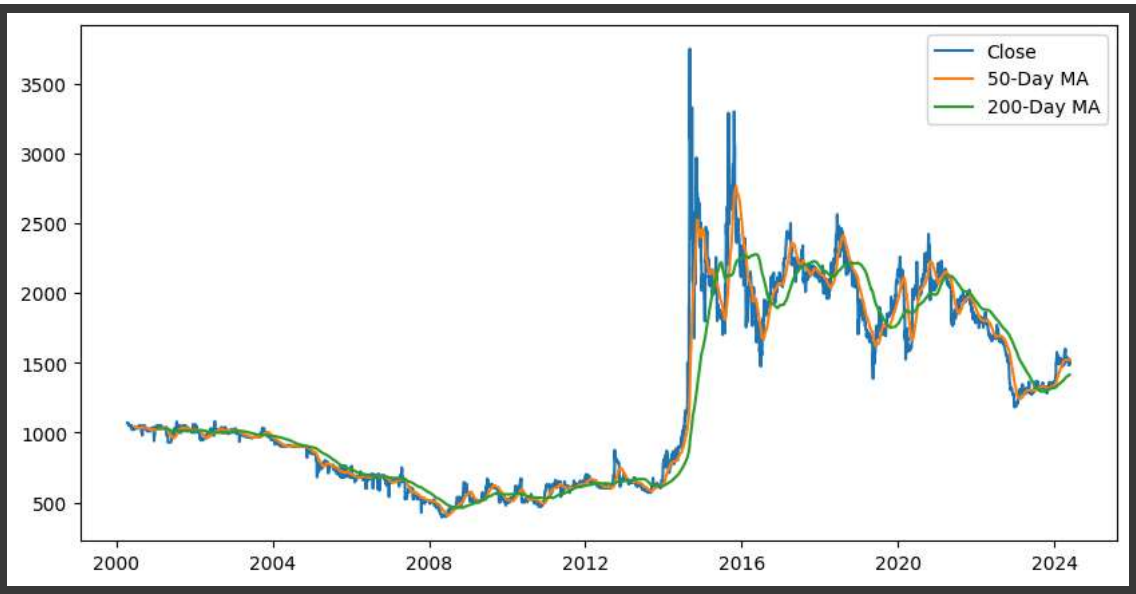
Next steps: Generate code with data | View recommended plots

```
# Convert the 'Date' column to a datetime object
data['Date'] = pd.to_datetime(data['Date'])
```

```
# Set the 'Date' column as the index
data.set_index('Date', inplace=True)
```

```
# Plotting the closing price
plt.figure(figsize=(10, 5))
plt.plot(data['Close'])
plt.title('KFC Stock Closing Prices')
plt.xlabel('Date')
plt.ylabel('Close Price')
plt.show()
```


```
data['MA50'] = data['Close'].rolling(window=50).mean()
data['MA200'] = data['Close'].rolling(window=200).mean()
# Plotting moving averages
plt.figure(figsize=(10, 5))
plt.plot(data['Close'], label='Close')
plt.plot(data['MA50'], label='50-Day MA')
plt.plot(data['MA200'], label='200-Day MA')
plt.legend()
plt.show()
```




```
# Perform the ADF test on the 'Close' series
result = adfuller(data['Close'])
print(f'ADF Statistic: {result[0]}')
print(f'p-value: {result[1]}')
```

```
ADF Statistic: -1.6472807856949119
p-value: 0.4584589587262821
```

```
# Difference the 'Close' series and perform the ADF test on the differenced series
data['Close_diff'] = data['Close'].diff().dropna()
result = adfuller(data['Close_diff'].dropna())
print(f'ADF Statistic: {result[0]}')
print(f'p-value: {result[1]}')
```

```
ADF Statistic: -15.647622150991435
p-value: 1.6111949134183322e-28
```

```
# Fit the ARIMA model
model = ARIMA(data['Close'], order=(0, 1, 0))
fit_model = model.fit()
```

```
/usr/local/lib/python3.10/dist-packages/statsmodels/tsa/base/tsa_model.py:473: ValueWarning: A date index has been provided, but it
  self._init_dates(dates, freq)
/usr/local/lib/python3.10/dist-packages/statsmodels/tsa/base/tsa_model.py:473: ValueWarning: A date index has been provided, but it
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  self._init_dates(dates, freq)
```

```
# Print the summary of the model
print(fit_model.summary())
```

```
                               SARIMAX Results
==============================================================================
Dep. Variable:                  Close   No. Observations:                 6025
Model:                 ARIMA(0, 1, 0)   Log Likelihood              -30272.889
Date:                Thu, 13 Jun 2024   AIC                          60547.778
Time:                        17:22:57   BIC                          60554.482
Sample:                             0   HQIC                         60550.106
                                 - 6025
Covariance Type:                  opg
==============================================================================
                 coef    std err          z      P>|z|      [0.025      0.975]
------------------------------------------------------------------------------
sigma2      1356.5729      3.940    344.285      0.000    1348.850    1364.296
===================================================================================
Ljung-Box (L1) (Q):                  62.97   Jarque-Bera (JB):           1478747.49
Prob(Q):                              0.00   Prob(JB):                         0.00
Heteroskedasticity (H):               3.60   Skew:                             1.86
Prob(H) (two-sided):                  0.00   Kurtosis:                        79.67
===================================================================================

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

```
# Forecast future values
forecast_steps = 30  # Number of steps to forecast
forecast = fit_model.forecast(steps=forecast_steps)
```

```
forecast_index = pd.date_range(start=data.index[-1], periods=forecast_steps + 1)
# Create a DataFrame for the forecast
forecast_df = pd.DataFrame(forecast, index=forecast_index, columns=['Forecast'])

# Plot the results
import matplotlib.pyplot as plt

plt.figure(figsize=(10, 5))
plt.plot(data['Close'], label='Observed')
plt.plot(forecast_df, label='Forecast')
plt.legend()
plt.show()
```

```
/usr/local/lib/python3.10/dist-packages/statsmodels/tsa/base/tsa_model.py:836: ValueW
  return get_prediction_index(
/usr/local/lib/python3.10/dist-packages/statsmodels/tsa/base/tsa_model.py:836: Future
  return get_prediction_index(
```