In [ ]:

```
NAME : SHINDE SHUBHAM DNYANDEV, ROLL NO. : EN23107121, BATCH : C
```

In [4]:

```
import pandas as pd
```

In [5]:

```
df = pd.read_csv("/home/admin1/RELIANCE.NS_1973-05-08_2025-03-01.csv")
df
```

Out[5]:

	date	open	high	low	close
0	1996-01-01 00:00:00+05:30	7.319124	7.358397	7.270925	7.345901
1	1996-01-02 00:00:00+05:30	7.328050	7.363753	7.235222	7.288776
2	1996-01-03 00:00:00+05:30	7.408381	7.745775	7.328050	7.344116
3	1996-01-04 00:00:00+05:30	7.274495	7.297702	7.178097	7.276280
4	1996-01-05 00:00:00+05:30	7.247718	7.247718	7.163816	7.226296
...	...	...	...	...	...
7319	2025-02-21 00:00:00+05:30	1228.699951	1240.000000	1222.150024	1228.150024
7320	2025-02-24 00:00:00+05:30	1216.550049	1223.250000	1210.500000	1214.550049
7321	2025-02-25 00:00:00+05:30	1211.000000	1221.000000	1201.500000	1204.000000
7322	2025-02-27 00:00:00+05:30	1212.800049	1215.000000	1200.650024	1207.099976
7323	2025-02-28 00:00:00+05:30	1202.000000	1217.349976	1193.300049	1200.099976

7324 rows × 7 columns

In [5]:

```
df.describe()
```

Out[5]:

	open	high	low	close	adj_close	
count	7324.000000	7324.000000	7324.000000	7324.000000	7324.000000	7.3
mean	326.804309	330.415930	322.919029	326.516915	312.722616	5.9
std	402.088964	405.818972	398.104232	401.798753	402.816495	1.0
min	5.462565	5.487558	5.428648	5.487558	2.505212	0.0
25%	24.984990	25.477694	24.527992	24.952858	16.965307	1.3
50%	197.244431	199.758835	194.650009	197.067268	176.555252	2.4
75%	384.945511	389.145729	381.762489	384.688339	370.944550	6.2
max	1604.449951	1608.800049	1585.500000	1600.900024	1595.484985	1.4

In [6]:

```
df.isnull().sum()
```

Out[6]:

```
date         0
open         0
high         0
low          0
close        0
adj_close    0
volume       0
dtype: int64
```

In [7]:

```
df.dtypes
```

Out[7]:

```
date          object
open         float64
high         float64
low          float64
close        float64
adj_close    float64
volume         int64
dtype: object
```

In [8]:

```
df["date"] = pd.to_datetime(df["date"])
df
```

Out[8]:

	date	open	high	low	close
0	1996-01-01 00:00:00+05:30	7.319124	7.358397	7.270925	7.345901
1	1996-01-02 00:00:00+05:30	7.328050	7.363753	7.235222	7.288776
2	1996-01-03 00:00:00+05:30	7.408381	7.745775	7.328050	7.344116
3	1996-01-04 00:00:00+05:30	7.274495	7.297702	7.178097	7.276280
4	1996-01-05 00:00:00+05:30	7.247718	7.247718	7.163816	7.226296
...	...	...	...	...	...
7319	2025-02-21 00:00:00+05:30	1228.699951	1240.000000	1222.150024	1228.150024
7320	2025-02-24 00:00:00+05:30	1216.550049	1223.250000	1210.500000	1214.550049
7321	2025-02-25 00:00:00+05:30	1211.000000	1221.000000	1201.500000	1204.000000
7322	2025-02-27 00:00:00+05:30	1212.800049	1215.000000	1200.650024	1207.099976
7323	2025-02-28 00:00:00+05:30	1202.000000	1217.349976	1193.300049	1200.099976

7324 rows × 7 columns

In [9]:

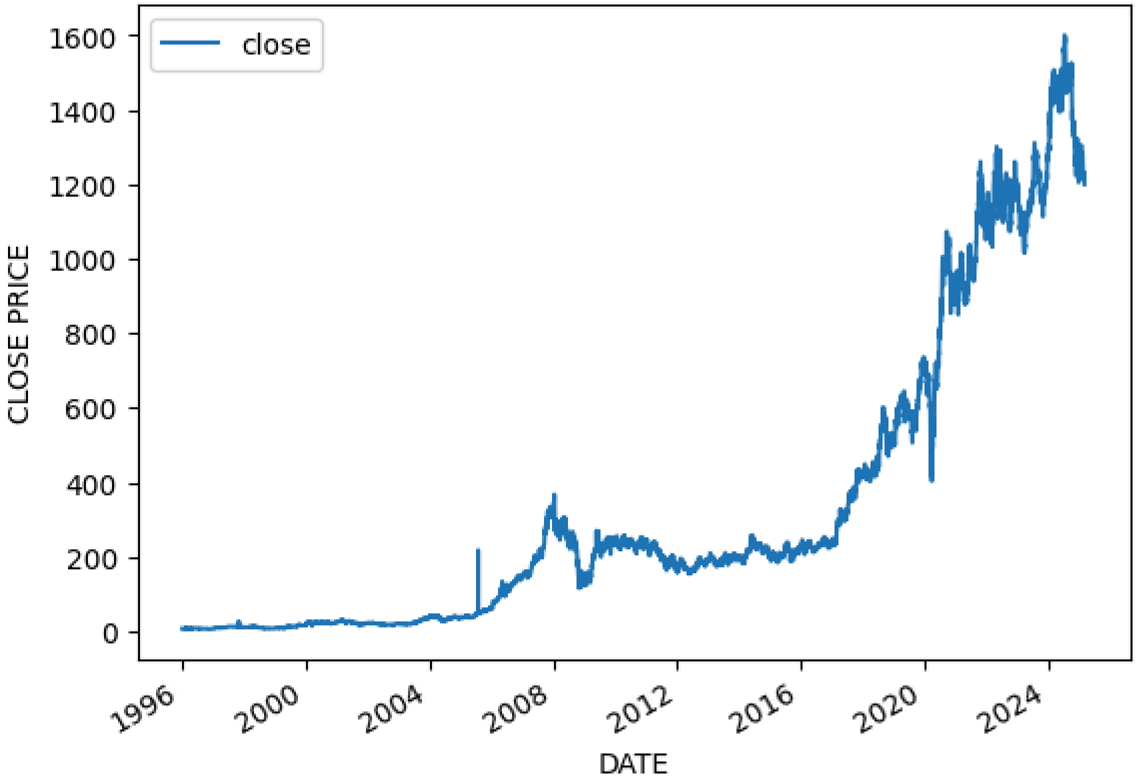
```
df.dtypes
```

```
Out[9]:  date         datetime64[ns, UTC+05:30]
         open                           float64
         high                           float64
         low                            float64
         close                          float64
         adj_close                      float64
         volume                           int64
         dtype: object
```

```
In [10]: import matplotlib.pyplot as plt
```

```
In [11]: df.plot(x = "date" , y = "close" , xlabel = "DATE" , ylabel = "CLOSE PRICE")
```

```
Out[11]: <Axes: xlabel='DATE', ylabel='CLOSE PRICE'>
```



```
In [12]: df["SMA_50"] = df["close"].rolling(window = 50).mean()
         df["SMA_50"]
```

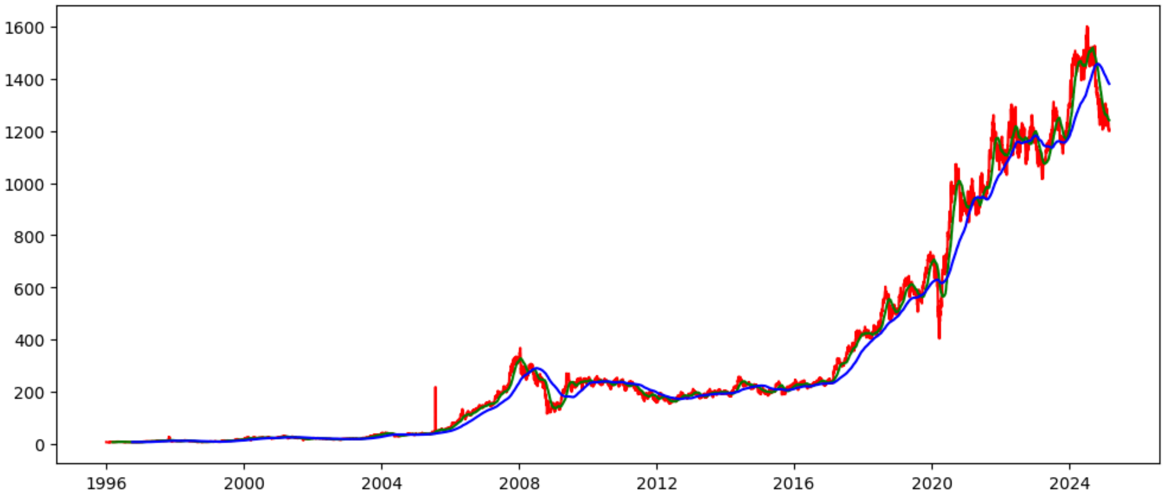
```
Out[12]: 0               NaN
         1               NaN
         2               NaN
         3               NaN
         4               NaN
                    ...
         7319    1244.585000
         7320    1243.510000
         7321    1242.683999
         7322    1241.760999
         7323    1241.153999
         Name: SMA_50, Length: 7324, dtype: float64
```

```
In [13]: df["SMA_200"] = df["close"].rolling(window = 200).mean()
         df["SMA_200"]
```

```
Out[13]: 0                NaN
         1                NaN
         2                NaN
         3                NaN
         4                NaN
                        ...
         7319    1384.737502
         7320    1383.839627
         7321    1382.822502
         7322    1381.844502
         7323    1380.744627
         Name: SMA_200, Length: 7324, dtype: float64
```

```
In [14]: plt.figure(figsize = (12, 5))
         plt.plot(df["date"], df["close"], color="Red")
         plt.plot(df["date"], df["SMA_50"], color="Green")
         plt.plot(df["date"], df["SMA_200"], color="Blue")
```

```
Out[14]: [<matplotlib.lines.Line2D at 0x1d2a1e3df90>]
```



```
In [19]: from statsmodels.tsa.arima.model import ARIMA
```

```
In [24]: train_size = int(len(df) * 0.8)
         train, test = df["close"][:train_size], df["close"][train_size:]
```

```
In [25]: model = ARIMA(train, order=(5, 1, 0))
         model_fit = model.fit()
```

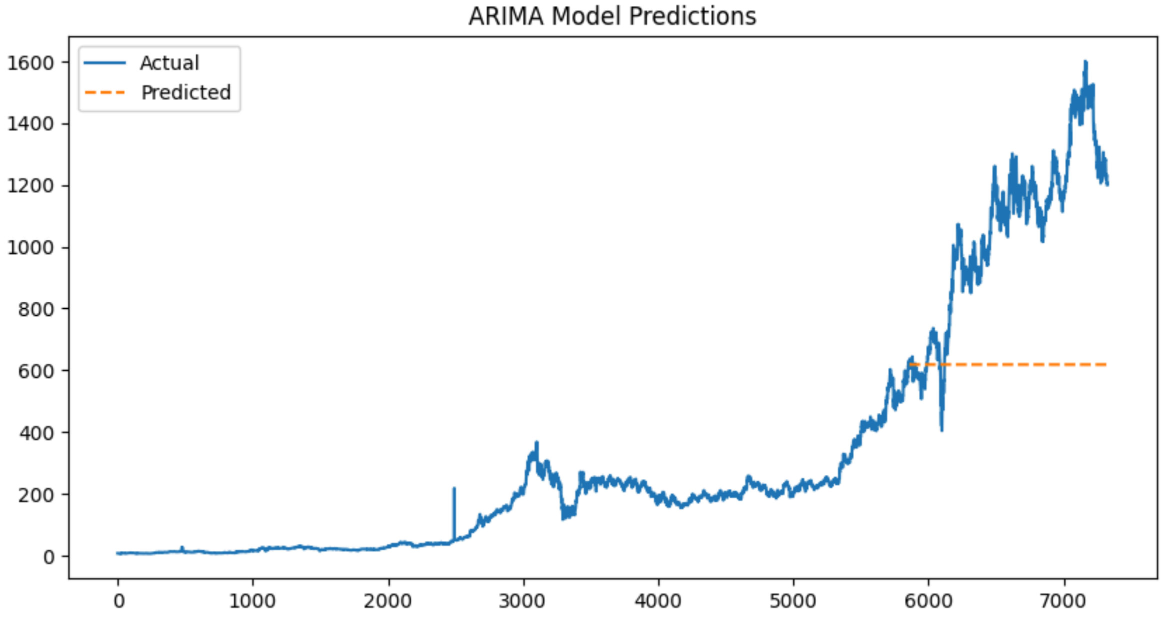
```
In [26]: predictions = model_fit.forecast(steps=len(test))
```

```
In [27]: predictions
```

```
Out[27]: 5859    618.658365
         5860    618.942345
         5861    618.665096
         5862    618.005105
         5863    618.446505
                    ...
         7319    618.359715
         7320    618.359715
         7321    618.359715
         7322    618.359715
```

```
7323    618.359715
Name: predicted_mean, Length: 1465, dtype: float64
```

```
In [31]: plt.figure(figsize=(10, 5))
         plt.plot(df.index, df['close'], label="Actual")
         plt.plot(test.index, predictions, label="Predicted", linestyle="dashed")
         plt.legend()
         plt.title("ARIMA Model Predictions")
         plt.show()
```



```
In [ ]:
```