EXP:8

17/4/2025

ARIMA model for time series forecasting.

AIM:

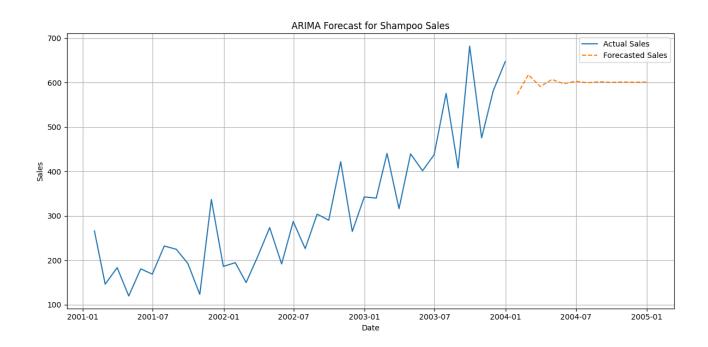
To implement a program for ARIMA model for time series forecasting.

PROCEDURE:

```
!pip install statsmodels
import pandas as pd
import numpy as np
import matplotlib.pyplot as plt
from statsmodels.tsa.arima.model import ARIMA
from google.colab import files
uploaded = files.upload()
filename = list(uploaded.keys())[0]
df = pd.read csv(filename)
df.columns = ['Month', 'Sales']
df['Sales'] = pd.to numeric(df['Sales'], errors='coerce')
df = df.dropna()
df['Month'] = pd.date range(start='2001-01-01', periods=len(df),
freq='M')
df.set index('Month', inplace=True)
model = ARIMA(df['Sales'], order=(1, 1, 1))
arima result = model.fit()
```

```
# Step 7: Forecast next 12 months
forecast = arima result.forecast(steps=12)
forecast index = pd.date range(df.index[-1] + pd.DateOffset(months=1),
periods=12, freq='M')
# Step 8: Plot actual and forecasted sales
plt.figure(figsize=(12, 6))
plt.plot(df.index, df['Sales'], label='Actual Sales')
plt.plot(forecast index, forecast, label='Forecasted Sales',
linestyle='--')
plt.title('ARIMA Forecast for Shampoo Sales')
plt.xlabel('Date')
plt.ylabel('Sales')
plt.legend()
plt.grid(True)
plt.tight layout()
plt.show()
# Step 9: Display model summary
print(arima result.summary())
```

OUTPUT:



RESULT:

Thus the program has been executed successfully.