#NAPQUEEN TASK 1

Installing Necessary Libraries and Importing Libraries

```
pip install pmdarima pandas numpy

Collecting pmdarima
  Downloading pmdarima-2.0.4-cp310-cp310-
manylinux_2_17_x86_64.manylinux2014_x86_64.manylinux_2_28_x86_64.whl.m
etadata (7.8 kB)
Requirement already satisfied: pandas in
/usr/local/lib/python3.10/dist-packages (2.1.4)
Requirement already satisfied: numpy in
/usr/local/lib/python3.10/dist-packages (1.26.4)
Requirement already satisfied: joblib>=0.11 in
/usr/local/lib/python3.10/dist-packages (from pmdarima) (1.4.2)
Requirement already satisfied: Cython!=0.29.18,!=0.29.31,>=0.29 in
/usr/local/lib/python3.10/dist-packages (from pmdarima) (3.0.10)
Requirement already satisfied: scikit-learn>=0.22 in
/usr/local/lib/python3.10/dist-packages (from pmdarima) (1.3.2)
Requirement already satisfied: scipy>=1.3.2 in
/usr/local/lib/python3.10/dist-packages (from pmdarima) (1.13.1)
Requirement already satisfied: statsmodels>=0.13.2 in
/usr/local/lib/python3.10/dist-packages (from pmdarima) (0.14.2)
Requirement already satisfied: urllib3 in
/usr/local/lib/python3.10/dist-packages (from pmdarima) (2.0.7)
Requirement already satisfied: setuptools!=50.0.0,>=38.6.0 in
/usr/local/lib/python3.10/dist-packages (from pmdarima) (71.0.4)
Requirement already satisfied: packaging>=17.1 in
/usr/local/lib/python3.10/dist-packages (from pmdarima) (24.1)
Requirement already satisfied: python-dateutil>=2.8.2 in
/usr/local/lib/python3.10/dist-packages (from pandas) (2.8.2)
Requirement already satisfied: pytz>=2020.1 in
/usr/local/lib/python3.10/dist-packages (from pandas) (2024.1)
Requirement already satisfied: tzdata>=2022.1 in
/usr/local/lib/python3.10/dist-packages (from pandas) (2024.1)
Requirement already satisfied: six>=1.5 in
/usr/local/lib/python3.10/dist-packages (from python-dateutil>=2.8.2-
>pandas) (1.16.0)
Requirement already satisfied: threadpoolctl>=2.0.0 in
/usr/local/lib/python3.10/dist-packages (from scikit-learn>=0.22-
>pmdarima) (3.5.0)
Requirement already satisfied: patsy>=0.5.6 in
/usr/local/lib/python3.10/dist-packages (from statsmodels>=0.13.2-
>pmdarima) (0.5.6)
Downloading pmdarima-2.0.4-cp310-cp310-
manylinux_2_17_x86_64.manylinux2014_x86_64.manylinux_2_28_x86_64.whl
(2.1 MB)
━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━ 2.1/2.1 MB 8.2 MB/s eta
```

```
0:00:00
darima
Successfully installed pmdarima-2.0.4

import pandas as pd
import pmdarima as pm
import matplotlib.pyplot as plt
import seaborn as sns
from datetime import timedelta
```

Reading Dataset

```
train_file_path = '/content/Task 1/train.csv'
test_file_path = '/content/Task 1/test.csv'

train_data = pd.read_csv(train_file_path)
test_data = pd.read_csv(test_file_path)

train_data['date'] = pd.to_datetime(train_data['date'],
errors='coerce')
test_data['date'] = pd.to_datetime(test_data['date'], errors='coerce')

train_data = train_data.dropna(subset=['Item Id', 'units'])
train_data = train_data[(train_data['units'] >= 0) &
(train_data['unit_price'] >= 0)]
train_data['ad_spend'] = train_data['ad_spend'].fillna(0)
```

Exploratory Data Analysis

```
def plot_time_series(item_id):
    item_data = train_data[train_data['Item Id'] == item_id]
    plt.figure(figsize=(12, 6))
    plt.plot(item_data['date'], item_data['units'], label='Units
Sold')
    plt.title(f'Time Series for Item ID: {item_id}')
    plt.xlabel('Date')
    plt.ylabel('Units Sold')
    plt.legend()
    plt.show()

for item_id in train_data['Item Id'].unique()[:3]:
    plot_time_series(item_id)
```

Time Series for Item ID: B09KDTS4DC

Time Series for Item ID: B09MR2MLZH

Time Series for Item ID: B09KSYL73R
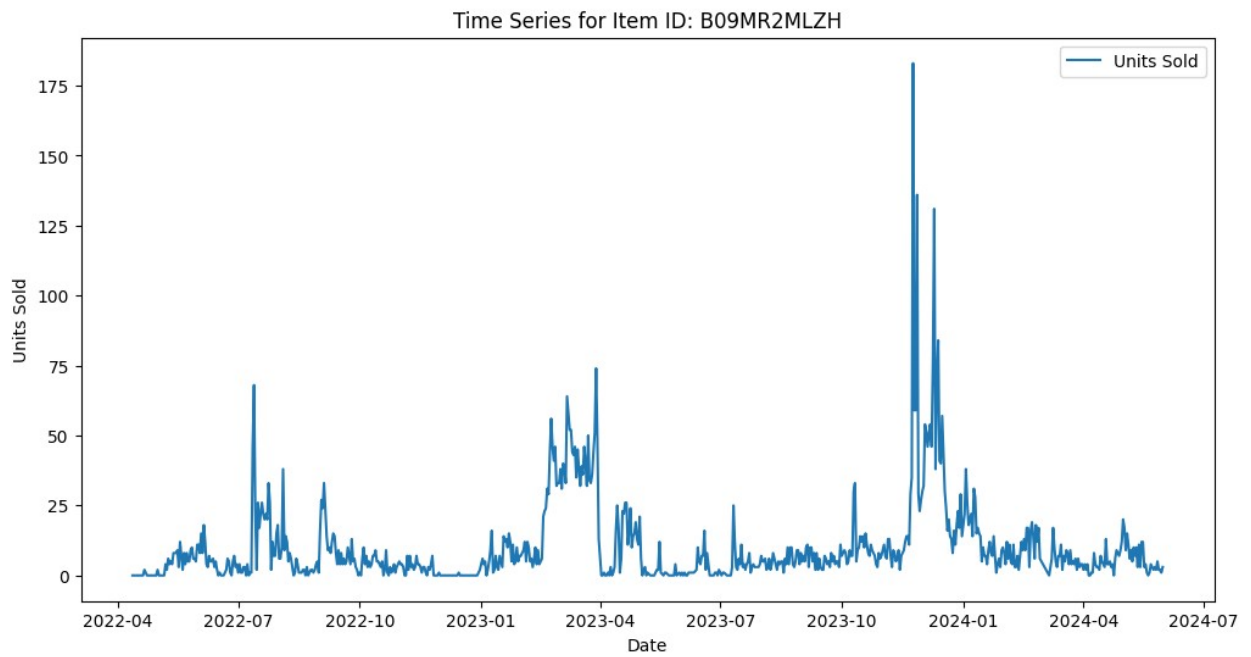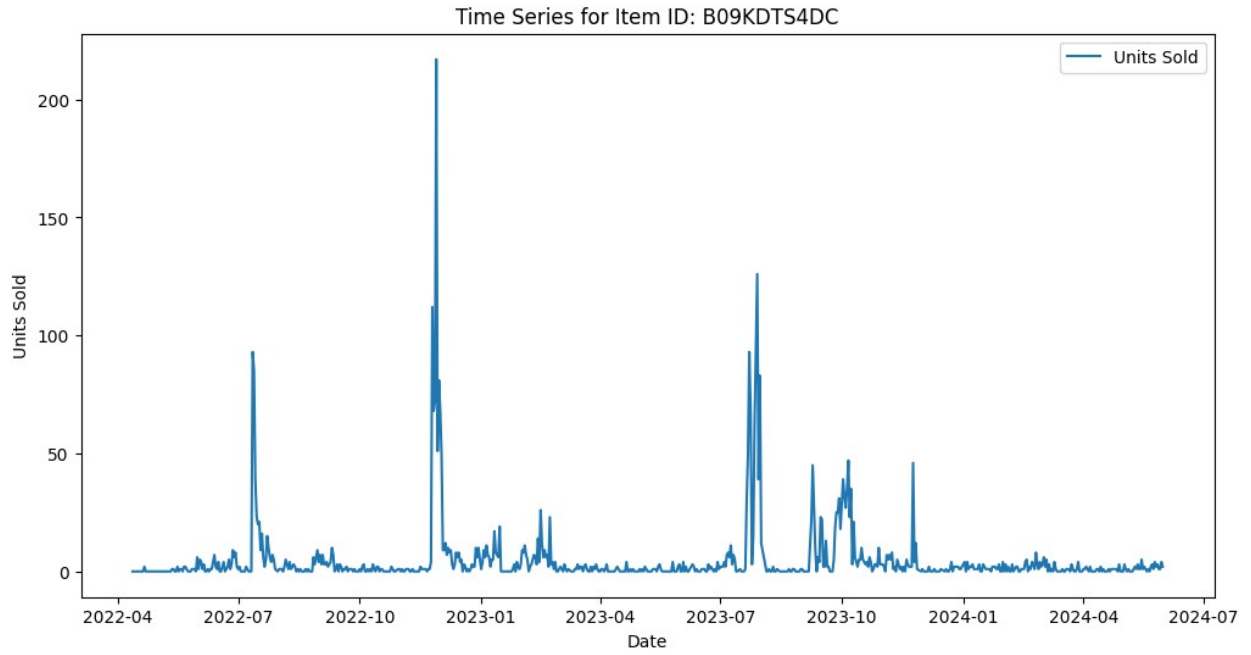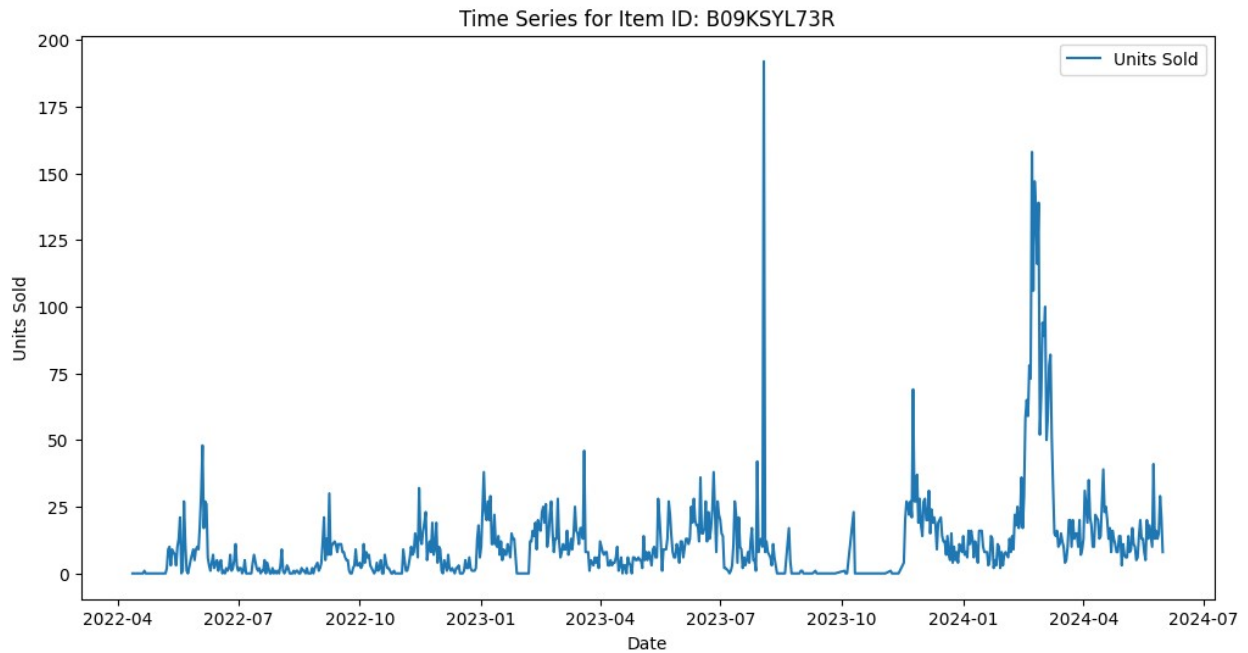
```
plt.figure(figsize=(12, 6))
sns.histplot(train_data['units'], bins=50, kde=True)
plt.title('Distribution of Units Sold')
plt.xlabel('Units')
plt.ylabel('Frequency')
plt.show()
```


Distribution of Units Sold
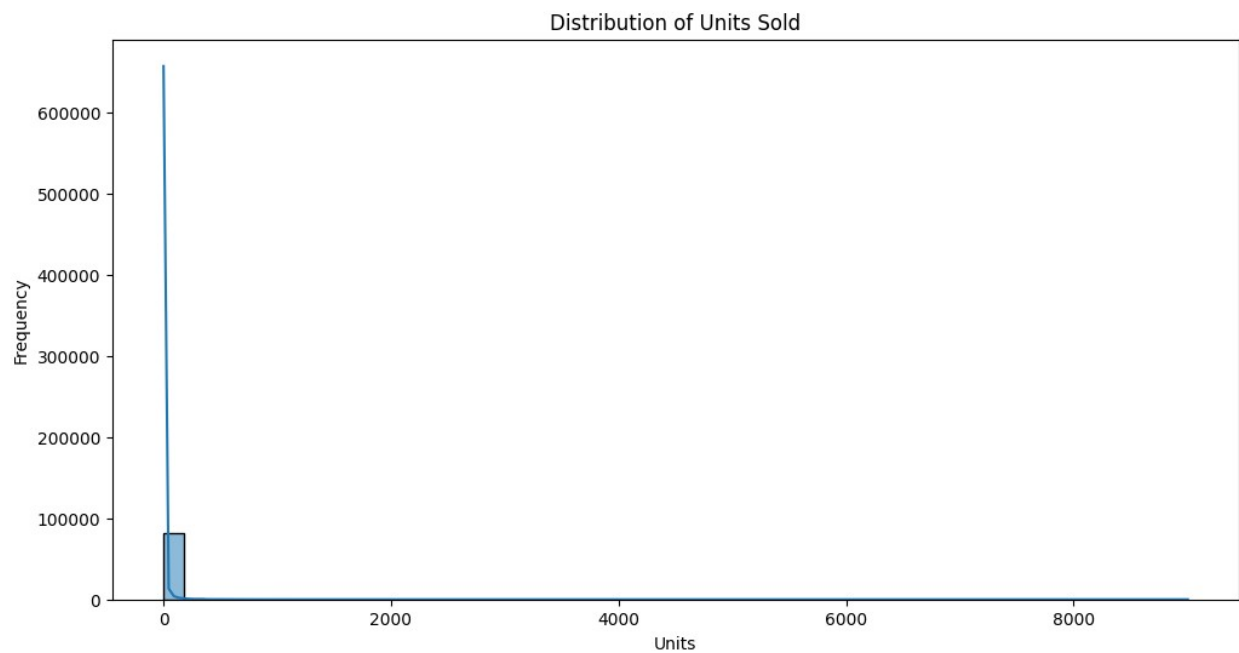
```
plt.figure(figsize=(12, 6))
sns.histplot(train_data['ad_spend'], bins=50, kde=True)
plt.title('Distribution of Ad Spend')
plt.xlabel('Ad Spend')
plt.ylabel('Frequency')
plt.show()
```
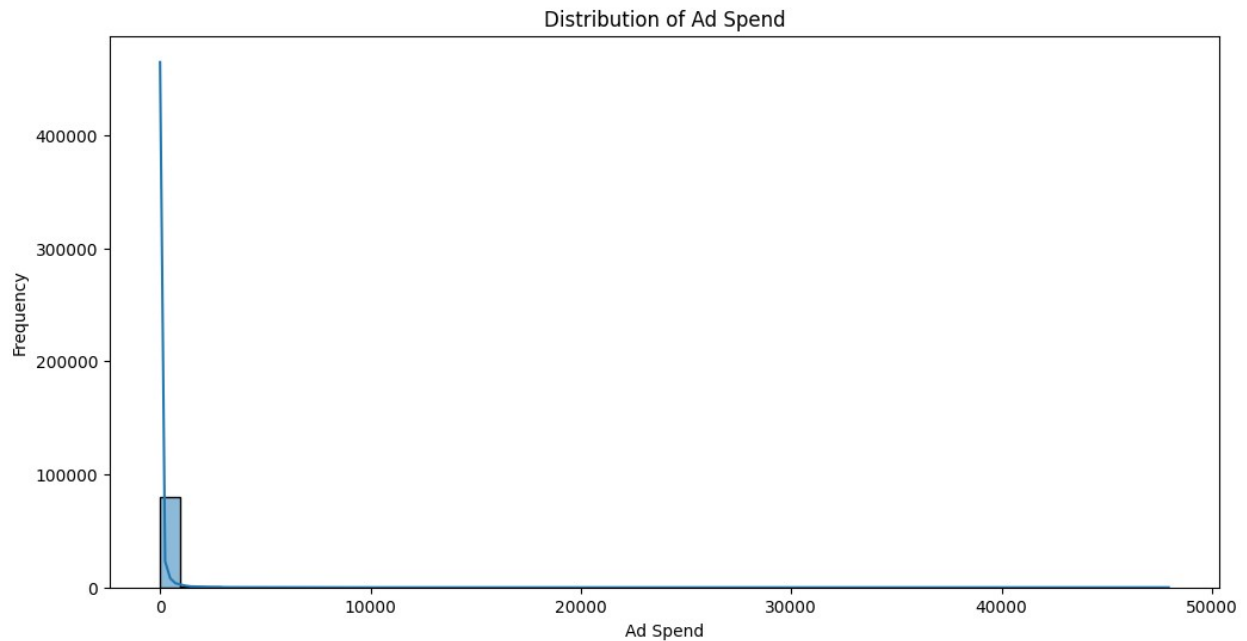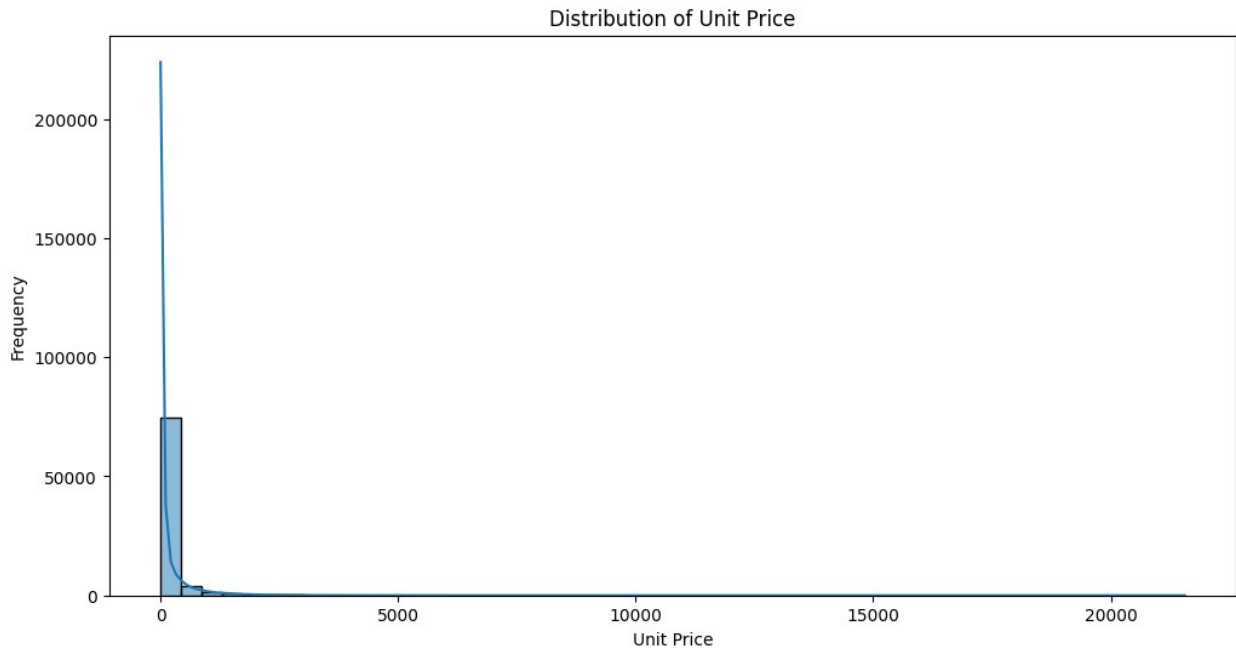

Distribution of Ad Spend

```
plt.figure(figsize=(12, 6))
sns.histplot(train_data['unit_price'], bins=50, kde=True)
plt.title('Distribution of Unit Price')
plt.xlabel('Unit Price')
plt.ylabel('Frequency')
plt.show()
```

Distribution of Unit Price

Feature Engineering

```python
def create_features(df):
    df['day_of_week'] = df['ds'].dt.dayofweek
    df['day_of_month'] = df['ds'].dt.day
    df['month'] = df['ds'].dt.month
    df['week_of_year'] = df['ds'].dt.isocalendar().week
    return df
```

Model Selection

```python
def prepare_item_data(item_id, data, is_train=True):
    item_data = data[data['Item Id'] == item_id].copy()
    columns = ['date', 'ad_spend', 'unit_price'] if not is_train else ['date', 'units', 'ad_spend', 'unit_price']
    item_data = item_data[columns]
    item_data = item_data.rename(columns={'date': 'ds'})
    if is_train:
        item_data = item_data.rename(columns={'units': 'y'})
    item_data = create_features(item_data)
    return item_data
```

HyperParameter Tuning

```python
def tune_and_forecast(item_id, train_data, test_data):
    item_train_data = prepare_item_data(item_id, train_data,
is_train=True)
    item_test_data = prepare_item_data(item_id, test_data,
is_train=False)


    if item_train_data.empty:
        print(f"Warning: No training data for item {item_id}. Skipping
forecast.")
        return []

    model = pm.auto_arima(
        item_train_data['y'],
        exogenous=item_train_data[['ad_spend', 'unit_price',
'day_of_week', 'day_of_month', 'month', 'week_of_year']],
        start_p=1, start_q=1,
        max_p=3, max_q=3,
        seasonal=False,
        stepwise=True,
        trace=True,
        error_action='ignore',
        suppress_warnings=True
    )

    n_periods = min(15, len(item_test_data))
    future_exog = item_test_data[['ad_spend', 'unit_price',
'day_of_week', 'day_of_month', 'month', 'week_of_year']]

    start = len(item_train_data)
    end = start + n_periods - 1

    if end > start:
        forecast, _ = model.predict(n_periods=n_periods,
exogenous=future_exog,
                                    return_conf_int=True, start=start,
end=end)

        forecast_list = []
        for date, yhat in zip(item_test_data['ds'], forecast):
            forecast_list.append({'date': date.strftime('%Y-%m-%d'),
'Item Id': item_id, 'TARGET': int(yhat)})
    else:
        print(f"Warning: Invalid prediction range for item {item_id}.
Skipping forecast.")
        forecast_list = []

    return forecast_list
```

```python
item_ids = train_data['Item Id'].unique()

all_forecasts = []

for item_id in item_ids:
    forecasts = tune_and_forecast(item_id, train_data, test_data)
    all_forecasts.extend(forecasts)
```

```
Performing stepwise search to minimize aic
 ARIMA(1,0,1)(0,0,0)[0]               : AIC=5835.043, Time=0.11 sec
 ARIMA(0,0,0)(0,0,0)[0]               : AIC=6346.930, Time=0.02 sec
 ARIMA(1,0,0)(0,0,0)[0]               : AIC=5881.709, Time=0.07 sec
 ARIMA(0,0,1)(0,0,0)[0]               : AIC=6071.172, Time=0.08 sec
 ARIMA(2,0,1)(0,0,0)[0]               : AIC=5835.699, Time=0.18 sec
 ARIMA(1,0,2)(0,0,0)[0]               : AIC=5834.850, Time=0.34 sec
 ARIMA(0,0,2)(0,0,0)[0]               : AIC=5989.983, Time=0.52 sec
 ARIMA(2,0,2)(0,0,0)[0]               : AIC=5835.601, Time=1.59 sec
 ARIMA(1,0,3)(0,0,0)[0]               : AIC=5834.342, Time=1.33 sec
 ARIMA(0,0,3)(0,0,0)[0]               : AIC=5874.630, Time=0.80 sec
 ARIMA(2,0,3)(0,0,0)[0]               : AIC=5828.768, Time=0.37 sec
 ARIMA(3,0,3)(0,0,0)[0]               : AIC=5828.417, Time=0.52 sec
 ARIMA(3,0,2)(0,0,0)[0]               : AIC=5826.897, Time=0.35 sec
 ARIMA(3,0,1)(0,0,0)[0]               : AIC=5826.063, Time=0.27 sec
 ARIMA(3,0,0)(0,0,0)[0]               : AIC=5832.359, Time=0.15 sec
 ARIMA(2,0,0)(0,0,0)[0]               : AIC=5837.886, Time=0.11 sec
 ARIMA(3,0,1)(0,0,0)[0] intercept     : AIC=5819.551, Time=0.85 sec
 ARIMA(2,0,1)(0,0,0)[0] intercept     : AIC=5829.195, Time=0.46 sec
 ARIMA(3,0,0)(0,0,0)[0] intercept     : AIC=5826.288, Time=0.32 sec
 ARIMA(3,0,2)(0,0,0)[0] intercept     : AIC=5819.420, Time=1.43 sec
 ARIMA(2,0,2)(0,0,0)[0] intercept     : AIC=5829.610, Time=0.73 sec
 ARIMA(3,0,3)(0,0,0)[0] intercept     : AIC=5820.570, Time=1.46 sec
 ARIMA(2,0,3)(0,0,0)[0] intercept     : AIC=5820.555, Time=1.02 sec

Best model:  ARIMA(3,0,2)(0,0,0)[0] intercept
Total fit time: 13.145 seconds
Performing stepwise search to minimize aic

/usr/local/lib/python3.10/dist-packages/statsmodels/tsa/base/
tsa_model.py:836: ValueWarning: No supported index is available.
Prediction results will be given with an integer index beginning at
`start`.
  return get_prediction_index(
/usr/local/lib/python3.10/dist-packages/statsmodels/tsa/base/tsa_model
.py:836: FutureWarning: No supported index is available. In the next
version, calling this method in a model without a supported index will
result in an exception.
  return get_prediction_index(

 ARIMA(1,1,1)(0,0,0)[0] intercept    : AIC=5692.709, Time=0.33 sec
 ARIMA(0,1,0)(0,0,0)[0] intercept    : AIC=5888.466, Time=0.04 sec
```

```
 ARIMA(1,1,0)(0,0,0)[0] intercept   : AIC=5779.069, Time=0.12 sec
 ARIMA(0,1,1)(0,0,0)[0] intercept   : AIC=5694.500, Time=0.22 sec
 ARIMA(0,1,0)(0,0,0)[0]             : AIC=5886.466, Time=0.03 sec
 ARIMA(2,1,1)(0,0,0)[0] intercept   : AIC=5654.717, Time=0.37 sec
 ARIMA(2,1,0)(0,0,0)[0] intercept   : AIC=5658.673, Time=0.22 sec
 ARIMA(3,1,1)(0,0,0)[0] intercept   : AIC=5650.104, Time=3.07 sec
 ARIMA(3,1,0)(0,0,0)[0] intercept   : AIC=5656.498, Time=1.61 sec
 ARIMA(3,1,2)(0,0,0)[0] intercept   : AIC=5631.884, Time=1.12 sec
 ARIMA(2,1,2)(0,0,0)[0] intercept   : AIC=5651.488, Time=0.67 sec
 ARIMA(3,1,3)(0,0,0)[0] intercept   : AIC=5633.204, Time=1.16 sec
 ARIMA(2,1,3)(0,0,0)[0] intercept   : AIC=5653.304, Time=0.98 sec
 ARIMA(3,1,2)(0,0,0)[0]             : AIC=5629.888, Time=0.70 sec
 ARIMA(2,1,2)(0,0,0)[0]             : AIC=5649.488, Time=0.30 sec
 ARIMA(3,1,1)(0,0,0)[0]             : AIC=5648.104, Time=0.53 sec
 ARIMA(3,1,3)(0,0,0)[0]             : AIC=5631.207, Time=0.64 sec
 ARIMA(2,1,1)(0,0,0)[0]             : AIC=5652.718, Time=0.16 sec
 ARIMA(2,1,3)(0,0,0)[0]             : AIC=5651.304, Time=0.48 sec

Best model:  ARIMA(3,1,2)(0,0,0)[0]
Total fit time: 12.791 seconds
Performing stepwise search to minimize aic

/usr/local/lib/python3.10/dist-packages/statsmodels/tsa/base/
tsa_model.py:836: ValueWarning: No supported index is available.
Prediction results will be given with an integer index beginning at
`start`.
  return get_prediction_index(
/usr/local/lib/python3.10/dist-packages/statsmodels/tsa/base/tsa_model
.py:836: FutureWarning: No supported index is available. In the next
version, calling this method in a model without a supported index will
result in an exception.
  return get_prediction_index(

 ARIMA(1,1,1)(0,0,0)[0] intercept   : AIC=5646.298, Time=0.27 sec
 ARIMA(0,1,0)(0,0,0)[0] intercept   : AIC=5877.665, Time=0.04 sec
 ARIMA(1,1,0)(0,0,0)[0] intercept   : AIC=5704.220, Time=0.12 sec
 ARIMA(0,1,1)(0,0,0)[0] intercept   : AIC=5645.899, Time=0.17 sec
 ARIMA(0,1,0)(0,0,0)[0]             : AIC=5875.665, Time=0.03 sec
 ARIMA(0,1,2)(0,0,0)[0] intercept   : AIC=5646.189, Time=0.31 sec
 ARIMA(1,1,2)(0,0,0)[0] intercept   : AIC=5647.178, Time=0.84 sec
 ARIMA(0,1,1)(0,0,0)[0]             : AIC=5643.914, Time=0.08 sec
 ARIMA(1,1,1)(0,0,0)[0]             : AIC=5644.312, Time=0.11 sec
 ARIMA(0,1,2)(0,0,0)[0]             : AIC=5644.202, Time=0.11 sec
 ARIMA(1,1,0)(0,0,0)[0]             : AIC=5702.223, Time=0.07 sec
 ARIMA(1,1,2)(0,0,0)[0]             : AIC=5645.190, Time=0.33 sec

Best model:  ARIMA(0,1,1)(0,0,0)[0]
Total fit time: 2.511 seconds
Performing stepwise search to minimize aic
```

```
/usr/local/lib/python3.10/dist-packages/statsmodels/tsa/base/
tsa_model.py:836: ValueWarning: No supported index is available.
Prediction results will be given with an integer index beginning at
`start`.
  return get_prediction_index(
/usr/local/lib/python3.10/dist-packages/statsmodels/tsa/base/tsa_model
.py:836: FutureWarning: No supported index is available. In the next
version, calling this method in a model without a supported index will
result in an exception.
  return get_prediction_index(

 ARIMA(1,1,1)(0,0,0)[0] intercept   : AIC=9573.419, Time=0.46 sec
 ARIMA(0,1,0)(0,0,0)[0] intercept   : AIC=9696.475, Time=0.04 sec
 ARIMA(1,1,0)(0,0,0)[0] intercept   : AIC=9679.885, Time=0.08 sec
 ARIMA(0,1,1)(0,0,0)[0] intercept   : AIC=9647.831, Time=0.91 sec
 ARIMA(0,1,0)(0,0,0)[0]             : AIC=9694.476, Time=0.05 sec
 ARIMA(2,1,1)(0,0,0)[0] intercept   : AIC=9564.249, Time=3.03 sec
 ARIMA(2,1,0)(0,0,0)[0] intercept   : AIC=9604.852, Time=0.29 sec
 ARIMA(3,1,1)(0,0,0)[0] intercept   : AIC=9558.021, Time=1.11 sec
 ARIMA(3,1,0)(0,0,0)[0] intercept   : AIC=9602.505, Time=0.16 sec
 ARIMA(3,1,2)(0,0,0)[0] intercept   : AIC=9554.825, Time=1.22 sec
 ARIMA(2,1,2)(0,0,0)[0] intercept   : AIC=9553.604, Time=0.83 sec
 ARIMA(1,1,2)(0,0,0)[0] intercept   : AIC=9554.727, Time=0.61 sec
 ARIMA(2,1,3)(0,0,0)[0] intercept   : AIC=9555.062, Time=1.87 sec
 ARIMA(1,1,3)(0,0,0)[0] intercept   : AIC=9556.618, Time=1.63 sec
 ARIMA(3,1,3)(0,0,0)[0] intercept   : AIC=9556.702, Time=2.17 sec
 ARIMA(2,1,2)(0,0,0)[0]             : AIC=9551.604, Time=0.45 sec
 ARIMA(1,1,2)(0,0,0)[0]             : AIC=9552.727, Time=1.27 sec
 ARIMA(2,1,1)(0,0,0)[0]             : AIC=9562.249, Time=1.09 sec
 ARIMA(3,1,2)(0,0,0)[0]             : AIC=9552.825, Time=2.22 sec
 ARIMA(2,1,3)(0,0,0)[0]             : AIC=9553.062, Time=0.83 sec
 ARIMA(1,1,1)(0,0,0)[0]             : AIC=9571.419, Time=0.23 sec
 ARIMA(1,1,3)(0,0,0)[0]             : AIC=9554.618, Time=0.79 sec
 ARIMA(3,1,1)(0,0,0)[0]             : AIC=9556.021, Time=0.48 sec
 ARIMA(3,1,3)(0,0,0)[0]             : AIC=9554.701, Time=1.04 sec

Best model:  ARIMA(2,1,2)(0,0,0)[0]
Total fit time: 22.917 seconds
Performing stepwise search to minimize aic

/usr/local/lib/python3.10/dist-packages/statsmodels/tsa/base/
tsa_model.py:836: ValueWarning: No supported index is available.
Prediction results will be given with an integer index beginning at
`start`.
  return get_prediction_index(
/usr/local/lib/python3.10/dist-packages/statsmodels/tsa/base/tsa_model
.py:836: FutureWarning: No supported index is available. In the next
version, calling this method in a model without a supported index will
result in an exception.
  return get_prediction_index(
```

```
 ARIMA(1,1,1)(0,0,0)[0] intercept   : AIC=6517.383, Time=0.30 sec
 ARIMA(0,1,0)(0,0,0)[0] intercept   : AIC=6587.816, Time=0.06 sec
 ARIMA(1,1,0)(0,0,0)[0] intercept   : AIC=6550.608, Time=0.08 sec
 ARIMA(0,1,1)(0,0,0)[0] intercept   : AIC=6540.272, Time=0.22 sec
 ARIMA(0,1,0)(0,0,0)[0]             : AIC=6585.816, Time=0.03 sec
 ARIMA(2,1,1)(0,0,0)[0] intercept   : AIC=6517.761, Time=0.55 sec
 ARIMA(1,1,2)(0,0,0)[0] intercept   : AIC=6518.269, Time=0.61 sec
 ARIMA(0,1,2)(0,0,0)[0] intercept   : AIC=6529.503, Time=0.29 sec
 ARIMA(2,1,0)(0,0,0)[0] intercept   : AIC=6549.096, Time=0.28 sec
 ARIMA(2,1,2)(0,0,0)[0] intercept   : AIC=6515.182, Time=0.68 sec
 ARIMA(3,1,2)(0,0,0)[0] intercept   : AIC=6505.219, Time=0.99 sec
 ARIMA(3,1,1)(0,0,0)[0] intercept   : AIC=6505.717, Time=0.62 sec
 ARIMA(3,1,3)(0,0,0)[0] intercept   : AIC=6506.127, Time=1.45 sec
 ARIMA(2,1,3)(0,0,0)[0] intercept   : AIC=6507.920, Time=2.90 sec
 ARIMA(3,1,2)(0,0,0)[0]             : AIC=6503.219, Time=1.81 sec
 ARIMA(2,1,2)(0,0,0)[0]             : AIC=6513.182, Time=0.32 sec
 ARIMA(3,1,1)(0,0,0)[0]             : AIC=6503.717, Time=0.29 sec
 ARIMA(3,1,3)(0,0,0)[0]             : AIC=6504.127, Time=0.73 sec
 ARIMA(2,1,1)(0,0,0)[0]             : AIC=6515.761, Time=0.26 sec
 ARIMA(2,1,3)(0,0,0)[0]             : AIC=6505.920, Time=0.53 sec

Best model:  ARIMA(3,1,2)(0,0,0)[0]
Total fit time: 13.031 seconds
Performing stepwise search to minimize aic

/usr/local/lib/python3.10/dist-packages/statsmodels/tsa/base/
tsa_model.py:836: ValueWarning: No supported index is available.
Prediction results will be given with an integer index beginning at
`start`.
  return get_prediction_index(
/usr/local/lib/python3.10/dist-packages/statsmodels/tsa/base/tsa_model
.py:836: FutureWarning: No supported index is available. In the next
version, calling this method in a model without a supported index will
result in an exception.
  return get_prediction_index(

 ARIMA(1,1,1)(0,0,0)[0] intercept   : AIC=inf, Time=1.00 sec
 ARIMA(0,1,0)(0,0,0)[0] intercept   : AIC=6735.600, Time=0.04 sec
 ARIMA(1,1,0)(0,0,0)[0] intercept   : AIC=6727.639, Time=0.08 sec
 ARIMA(0,1,1)(0,0,0)[0] intercept   : AIC=6725.948, Time=0.22 sec
 ARIMA(0,1,0)(0,0,0)[0]             : AIC=6733.617, Time=0.04 sec
 ARIMA(0,1,2)(0,0,0)[0] intercept   : AIC=6721.559, Time=0.29 sec
 ARIMA(1,1,2)(0,0,0)[0] intercept   : AIC=inf, Time=3.17 sec
 ARIMA(0,1,3)(0,0,0)[0] intercept   : AIC=6723.063, Time=0.39 sec
 ARIMA(1,1,3)(0,0,0)[0] intercept   : AIC=inf, Time=1.92 sec
 ARIMA(0,1,2)(0,0,0)[0]             : AIC=6719.594, Time=0.19 sec
 ARIMA(0,1,1)(0,0,0)[0]             : AIC=6723.971, Time=0.11 sec
 ARIMA(1,1,2)(0,0,0)[0]             : AIC=inf, Time=1.13 sec
 ARIMA(0,1,3)(0,0,0)[0]             : AIC=6721.106, Time=1.10 sec
 ARIMA(1,1,1)(0,0,0)[0]             : AIC=inf, Time=0.97 sec
```

```
 ARIMA(1,1,3)(0,0,0)[0]                   : AIC=inf, Time=1.34 sec

Best model:  ARIMA(0,1,2)(0,0,0)[0]
Total fit time: 11.993 seconds
Performing stepwise search to minimize aic

/usr/local/lib/python3.10/dist-packages/statsmodels/tsa/base/
tsa_model.py:836: ValueWarning: No supported index is available.
Prediction results will be given with an integer index beginning at
`start`.
  return get_prediction_index(
/usr/local/lib/python3.10/dist-packages/statsmodels/tsa/base/tsa_model
.py:836: FutureWarning: No supported index is available. In the next
version, calling this method in a model without a supported index will
result in an exception.
  return get_prediction_index(

 ARIMA(1,1,1)(0,0,0)[0] intercept   : AIC=7553.536, Time=0.43 sec
 ARIMA(0,1,0)(0,0,0)[0] intercept   : AIC=7629.780, Time=0.04 sec
 ARIMA(1,1,0)(0,0,0)[0] intercept   : AIC=7588.760, Time=0.08 sec
 ARIMA(0,1,1)(0,0,0)[0] intercept   : AIC=7576.175, Time=0.24 sec
 ARIMA(0,1,0)(0,0,0)[0]             : AIC=7627.780, Time=0.03 sec
 ARIMA(2,1,1)(0,0,0)[0] intercept   : AIC=7573.600, Time=0.44 sec
 ARIMA(1,1,2)(0,0,0)[0] intercept   : AIC=7569.668, Time=0.53 sec
 ARIMA(0,1,2)(0,0,0)[0] intercept   : AIC=7573.329, Time=0.29 sec
 ARIMA(2,1,0)(0,0,0)[0] intercept   : AIC=7571.873, Time=0.11 sec
 ARIMA(2,1,2)(0,0,0)[0] intercept   : AIC=7571.629, Time=0.73 sec
 ARIMA(1,1,1)(0,0,0)[0]             : AIC=7553.141, Time=0.21 sec
 ARIMA(0,1,1)(0,0,0)[0]             : AIC=7574.176, Time=0.11 sec
 ARIMA(1,1,0)(0,0,0)[0]             : AIC=7586.760, Time=0.05 sec
 ARIMA(2,1,1)(0,0,0)[0]             : AIC=7571.601, Time=0.23 sec
 ARIMA(1,1,2)(0,0,0)[0]             : AIC=7567.671, Time=0.28 sec
 ARIMA(0,1,2)(0,0,0)[0]             : AIC=7571.334, Time=0.13 sec
 ARIMA(2,1,0)(0,0,0)[0]             : AIC=7569.874, Time=0.06 sec
 ARIMA(2,1,2)(0,0,0)[0]             : AIC=7569.632, Time=0.38 sec

Best model:  ARIMA(1,1,1)(0,0,0)[0]
Total fit time: 4.387 seconds
Performing stepwise search to minimize aic

/usr/local/lib/python3.10/dist-packages/statsmodels/tsa/base/
tsa_model.py:836: ValueWarning: No supported index is available.
Prediction results will be given with an integer index beginning at
`start`.
  return get_prediction_index(
/usr/local/lib/python3.10/dist-packages/statsmodels/tsa/base/tsa_model
.py:836: FutureWarning: No supported index is available. In the next
version, calling this method in a model without a supported index will
result in an exception.
  return get_prediction_index(
```

```
 ARIMA(1,0,1)(0,0,0)[0]                 : AIC=6092.080, Time=0.18 sec
 ARIMA(0,0,0)(0,0,0)[0]                 : AIC=7237.407, Time=0.02 sec
 ARIMA(1,0,0)(0,0,0)[0]                 : AIC=6096.995, Time=0.07 sec
 ARIMA(0,0,1)(0,0,0)[0]                 : AIC=6632.037, Time=0.09 sec
 ARIMA(2,0,1)(0,0,0)[0]                 : AIC=6094.987, Time=0.35 sec
 ARIMA(1,0,2)(0,0,0)[0]                 : AIC=6079.692, Time=0.18 sec
 ARIMA(0,0,2)(0,0,0)[0]                 : AIC=6449.065, Time=0.16 sec
 ARIMA(2,0,2)(0,0,0)[0]                 : AIC=6077.764, Time=0.29 sec
 ARIMA(3,0,2)(0,0,0)[0]                 : AIC=6070.614, Time=1.02 sec
 ARIMA(3,0,1)(0,0,0)[0]                 : AIC=6079.893, Time=0.32 sec
 ARIMA(3,0,3)(0,0,0)[0]                 : AIC=6070.019, Time=1.06 sec
 ARIMA(2,0,3)(0,0,0)[0]                 : AIC=6078.358, Time=0.65 sec
 ARIMA(3,0,3)(0,0,0)[0] intercept       : AIC=6067.452, Time=4.82 sec
 ARIMA(2,0,3)(0,0,0)[0] intercept       : AIC=6070.660, Time=1.19 sec
 ARIMA(3,0,2)(0,0,0)[0] intercept       : AIC=6067.312, Time=1.85 sec
 ARIMA(2,0,2)(0,0,0)[0] intercept       : AIC=6069.037, Time=0.69 sec
 ARIMA(3,0,1)(0,0,0)[0] intercept       : AIC=6069.901, Time=1.10 sec
 ARIMA(2,0,1)(0,0,0)[0] intercept       : AIC=6080.782, Time=0.76 sec

Best model:  ARIMA(3,0,2)(0,0,0)[0] intercept
Total fit time: 14.832 seconds
Performing stepwise search to minimize aic

/usr/local/lib/python3.10/dist-packages/statsmodels/tsa/base/
tsa_model.py:836: ValueWarning: No supported index is available.
Prediction results will be given with an integer index beginning at
`start`.
  return get_prediction_index(
/usr/local/lib/python3.10/dist-packages/statsmodels/tsa/base/tsa_model
.py:836: FutureWarning: No supported index is available. In the next
version, calling this method in a model without a supported index will
result in an exception.
  return get_prediction_index(

 ARIMA(1,1,1)(0,0,0)[0] intercept       : AIC=2234.927, Time=0.45 sec
 ARIMA(0,1,0)(0,0,0)[0] intercept       : AIC=2616.818, Time=0.04 sec
 ARIMA(1,1,0)(0,0,0)[0] intercept       : AIC=2453.750, Time=0.10 sec
 ARIMA(0,1,1)(0,0,0)[0] intercept       : AIC=2238.091, Time=0.29 sec
 ARIMA(0,1,0)(0,0,0)[0]                 : AIC=2614.820, Time=0.03 sec
 ARIMA(2,1,1)(0,0,0)[0] intercept       : AIC=2236.817, Time=0.61 sec
 ARIMA(1,1,2)(0,0,0)[0] intercept       : AIC=2237.163, Time=0.82 sec
 ARIMA(0,1,2)(0,0,0)[0] intercept       : AIC=2235.046, Time=0.70 sec
 ARIMA(2,1,0)(0,0,0)[0] intercept       : AIC=2367.135, Time=0.16 sec
 ARIMA(2,1,2)(0,0,0)[0] intercept       : AIC=2238.171, Time=1.20 sec
 ARIMA(1,1,1)(0,0,0)[0]                 : AIC=2233.082, Time=0.39 sec
 ARIMA(0,1,1)(0,0,0)[0]                 : AIC=2236.214, Time=0.75 sec
 ARIMA(1,1,0)(0,0,0)[0]                 : AIC=2451.753, Time=0.11 sec
 ARIMA(2,1,1)(0,0,0)[0]                 : AIC=2234.976, Time=0.85 sec
 ARIMA(1,1,2)(0,0,0)[0]                 : AIC=2235.304, Time=0.67 sec
 ARIMA(0,1,2)(0,0,0)[0]                 : AIC=2233.199, Time=1.22 sec
```

```
 ARIMA(2,1,0)(0,0,0)[0]               : AIC=2365.139, Time=0.16 sec
 ARIMA(2,1,2)(0,0,0)[0]               : AIC=2236.323, Time=0.49 sec

Best model:  ARIMA(1,1,1)(0,0,0)[0]
Total fit time: 9.069 seconds
Performing stepwise search to minimize aic

/usr/local/lib/python3.10/dist-packages/statsmodels/tsa/base/
tsa_model.py:836: ValueWarning: No supported index is available.
Prediction results will be given with an integer index beginning at
`start`.
  return get_prediction_index(
/usr/local/lib/python3.10/dist-packages/statsmodels/tsa/base/tsa_model
.py:836: FutureWarning: No supported index is available. In the next
version, calling this method in a model without a supported index will
result in an exception.
  return get_prediction_index(

 ARIMA(1,1,1)(0,0,0)[0] intercept   : AIC=5004.225, Time=0.31 sec
 ARIMA(0,1,0)(0,0,0)[0] intercept   : AIC=5076.499, Time=0.05 sec
 ARIMA(1,1,0)(0,0,0)[0] intercept   : AIC=5013.435, Time=0.12 sec
 ARIMA(0,1,1)(0,0,0)[0] intercept   : AIC=5003.037, Time=0.17 sec
 ARIMA(0,1,0)(0,0,0)[0]             : AIC=5074.517, Time=0.03 sec
 ARIMA(0,1,2)(0,0,0)[0] intercept   : AIC=5004.367, Time=0.27 sec
 ARIMA(1,1,2)(0,0,0)[0] intercept   : AIC=inf, Time=1.46 sec
 ARIMA(0,1,1)(0,0,0)[0]             : AIC=5001.090, Time=0.07 sec
 ARIMA(1,1,1)(0,0,0)[0]             : AIC=5002.288, Time=0.11 sec
 ARIMA(0,1,2)(0,0,0)[0]             : AIC=5002.427, Time=0.12 sec
 ARIMA(1,1,0)(0,0,0)[0]             : AIC=5011.469, Time=0.07 sec
 ARIMA(1,1,2)(0,0,0)[0]             : AIC=inf, Time=0.67 sec

Best model:  ARIMA(0,1,1)(0,0,0)[0]
Total fit time: 3.465 seconds
Performing stepwise search to minimize aic

/usr/local/lib/python3.10/dist-packages/statsmodels/tsa/base/
tsa_model.py:836: ValueWarning: No supported index is available.
Prediction results will be given with an integer index beginning at
`start`.
  return get_prediction_index(
/usr/local/lib/python3.10/dist-packages/statsmodels/tsa/base/tsa_model
.py:836: FutureWarning: No supported index is available. In the next
version, calling this method in a model without a supported index will
result in an exception.
  return get_prediction_index(

 ARIMA(1,1,1)(0,0,0)[0] intercept   : AIC=inf, Time=0.35 sec
 ARIMA(0,1,0)(0,0,0)[0] intercept   : AIC=6608.769, Time=0.04 sec
 ARIMA(1,1,0)(0,0,0)[0] intercept   : AIC=6603.559, Time=0.09 sec
 ARIMA(0,1,1)(0,0,0)[0] intercept   : AIC=6598.266, Time=0.21 sec
```

```
 ARIMA(0,1,0)(0,0,0)[0]                 : AIC=6606.781, Time=0.03 sec
 ARIMA(0,1,2)(0,0,0)[0] intercept       : AIC=6549.278, Time=0.45 sec
 ARIMA(1,1,2)(0,0,0)[0] intercept       : AIC=6545.253, Time=0.49 sec
 ARIMA(2,1,2)(0,0,0)[0] intercept       : AIC=6542.822, Time=0.82 sec
 ARIMA(2,1,1)(0,0,0)[0] intercept       : AIC=6543.903, Time=0.49 sec
 ARIMA(3,1,2)(0,0,0)[0] intercept       : AIC=6544.397, Time=1.20 sec
 ARIMA(2,1,3)(0,0,0)[0] intercept       : AIC=6543.762, Time=0.99 sec
 ARIMA(1,1,3)(0,0,0)[0] intercept       : AIC=6547.078, Time=0.59 sec
 ARIMA(3,1,1)(0,0,0)[0] intercept       : AIC=6544.526, Time=1.09 sec
 ARIMA(3,1,3)(0,0,0)[0] intercept       : AIC=6544.393, Time=4.58 sec
 ARIMA(2,1,2)(0,0,0)[0]                 : AIC=6540.862, Time=0.33 sec
 ARIMA(1,1,2)(0,0,0)[0]                 : AIC=6543.306, Time=0.21 sec
 ARIMA(2,1,1)(0,0,0)[0]                 : AIC=6541.953, Time=0.21 sec
 ARIMA(3,1,2)(0,0,0)[0]                 : AIC=6542.436, Time=0.54 sec
 ARIMA(2,1,3)(0,0,0)[0]                 : AIC=6541.801, Time=0.40 sec
 ARIMA(1,1,1)(0,0,0)[0]                 : AIC=6552.455, Time=0.36 sec
 ARIMA(1,1,3)(0,0,0)[0]                 : AIC=6545.131, Time=0.23 sec
 ARIMA(3,1,1)(0,0,0)[0]                 : AIC=6542.572, Time=0.30 sec
 ARIMA(3,1,3)(0,0,0)[0]                 : AIC=6542.433, Time=0.76 sec

Best model:  ARIMA(2,1,2)(0,0,0)[0]
Total fit time: 14.768 seconds
Performing stepwise search to minimize aic
```

/usr/local/lib/python3.10/dist-packages/statsmodels/tsa/base/
tsa_model.py:836: ValueWarning: No supported index is available.
Prediction results will be given with an integer index beginning at
`start`.
  return get_prediction_index(
/usr/local/lib/python3.10/dist-packages/statsmodels/tsa/base/tsa_model
.py:836: FutureWarning: No supported index is available. In the next
version, calling this method in a model without a supported index will
result in an exception.
  return get_prediction_index(

```
 ARIMA(1,1,1)(0,0,0)[0] intercept       : AIC=9405.013, Time=0.47 sec
 ARIMA(0,1,0)(0,0,0)[0] intercept       : AIC=9644.235, Time=0.04 sec
 ARIMA(1,1,0)(0,0,0)[0] intercept       : AIC=9488.906, Time=0.15 sec
 ARIMA(0,1,1)(0,0,0)[0] intercept       : AIC=9403.427, Time=0.26 sec
 ARIMA(0,1,0)(0,0,0)[0]                 : AIC=9642.236, Time=0.04 sec
 ARIMA(0,1,2)(0,0,0)[0] intercept       : AIC=9404.993, Time=0.39 sec
 ARIMA(1,1,2)(0,0,0)[0] intercept       : AIC=9392.941, Time=0.63 sec
 ARIMA(2,1,2)(0,0,0)[0] intercept       : AIC=9386.358, Time=0.82 sec
 ARIMA(2,1,1)(0,0,0)[0] intercept       : AIC=9387.992, Time=0.26 sec
 ARIMA(3,1,2)(0,0,0)[0] intercept       : AIC=9341.791, Time=1.37 sec
 ARIMA(3,1,1)(0,0,0)[0] intercept       : AIC=9391.112, Time=0.24 sec
 ARIMA(3,1,3)(0,0,0)[0] intercept       : AIC=9342.361, Time=3.63 sec
 ARIMA(2,1,3)(0,0,0)[0] intercept       : AIC=9386.906, Time=2.80 sec
 ARIMA(3,1,2)(0,0,0)[0]                 : AIC=9339.825, Time=0.82 sec
 ARIMA(2,1,2)(0,0,0)[0]                 : AIC=9384.358, Time=0.42 sec
```

```
 ARIMA(3,1,1)(0,0,0)[0]                   : AIC=9389.112, Time=0.12 sec
 ARIMA(3,1,3)(0,0,0)[0]                   : AIC=9340.394, Time=1.21 sec
 ARIMA(2,1,1)(0,0,0)[0]                   : AIC=9385.992, Time=0.11 sec
 ARIMA(2,1,3)(0,0,0)[0]                   : AIC=9384.906, Time=0.63 sec

Best model:  ARIMA(3,1,2)(0,0,0)[0]
Total fit time: 14.456 seconds
Performing stepwise search to minimize aic

/usr/local/lib/python3.10/dist-packages/statsmodels/tsa/base/
tsa_model.py:836: ValueWarning: No supported index is available.
Prediction results will be given with an integer index beginning at
`start`.
  return get_prediction_index(
/usr/local/lib/python3.10/dist-packages/statsmodels/tsa/base/tsa_model
.py:836: FutureWarning: No supported index is available. In the next
version, calling this method in a model without a supported index will
result in an exception.
  return get_prediction_index(

 ARIMA(1,0,1)(0,0,0)[0]                   : AIC=10856.201, Time=0.22 sec
 ARIMA(0,0,0)(0,0,0)[0]                   : AIC=11281.426, Time=0.03 sec
 ARIMA(1,0,0)(0,0,0)[0]                   : AIC=10898.948, Time=0.04 sec
 ARIMA(0,0,1)(0,0,0)[0]                   : AIC=10862.084, Time=0.12 sec
 ARIMA(2,0,1)(0,0,0)[0]                   : AIC=10810.880, Time=0.34 sec
 ARIMA(2,0,0)(0,0,0)[0]                   : AIC=10898.742, Time=0.08 sec
 ARIMA(3,0,1)(0,0,0)[0]                   : AIC=10780.768, Time=0.41 sec
 ARIMA(3,0,0)(0,0,0)[0]                   : AIC=10817.845, Time=0.09 sec
 ARIMA(3,0,2)(0,0,0)[0]                   : AIC=10770.899, Time=0.50 sec
 ARIMA(2,0,2)(0,0,0)[0]                   : AIC=10770.121, Time=0.36 sec
 ARIMA(1,0,2)(0,0,0)[0]                   : AIC=10791.981, Time=0.27 sec
 ARIMA(2,0,3)(0,0,0)[0]                   : AIC=10771.027, Time=0.56 sec
 ARIMA(1,0,3)(0,0,0)[0]                   : AIC=10769.697, Time=0.19 sec
 ARIMA(0,0,3)(0,0,0)[0]                   : AIC=10821.388, Time=0.29 sec
 ARIMA(0,0,2)(0,0,0)[0]                   : AIC=10859.679, Time=0.24 sec
 ARIMA(1,0,3)(0,0,0)[0] intercept   : AIC=10767.821, Time=0.79 sec
 ARIMA(0,0,3)(0,0,0)[0] intercept   : AIC=10812.629, Time=0.62 sec
 ARIMA(1,0,2)(0,0,0)[0] intercept   : AIC=10791.050, Time=0.67 sec
 ARIMA(2,0,3)(0,0,0)[0] intercept   : AIC=10769.554, Time=3.09 sec
 ARIMA(0,0,2)(0,0,0)[0] intercept   : AIC=10847.719, Time=1.47 sec
 ARIMA(2,0,2)(0,0,0)[0] intercept   : AIC=10768.875, Time=0.84 sec

Best model:  ARIMA(1,0,3)(0,0,0)[0] intercept
Total fit time: 11.253 seconds
Performing stepwise search to minimize aic

/usr/local/lib/python3.10/dist-packages/statsmodels/tsa/base/
tsa_model.py:836: ValueWarning: No supported index is available.
Prediction results will be given with an integer index beginning at
`start`.
```

```
  return get_prediction_index(
/usr/local/lib/python3.10/dist-packages/statsmodels/tsa/base/tsa_model
.py:836: FutureWarning: No supported index is available. In the next
version, calling this method in a model without a supported index will
result in an exception.
  return get_prediction_index(

 ARIMA(1,1,1)(0,0,0)[0] intercept   : AIC=5330.565, Time=0.30 sec
 ARIMA(0,1,0)(0,0,0)[0] intercept   : AIC=5633.192, Time=0.04 sec
 ARIMA(1,1,0)(0,0,0)[0] intercept   : AIC=5494.899, Time=0.12 sec
 ARIMA(0,1,1)(0,0,0)[0] intercept   : AIC=5336.428, Time=0.22 sec
 ARIMA(0,1,0)(0,0,0)[0]             : AIC=5631.194, Time=0.03 sec
 ARIMA(2,1,1)(0,0,0)[0] intercept   : AIC=5331.986, Time=0.50 sec
 ARIMA(1,1,2)(0,0,0)[0] intercept   : AIC=5324.368, Time=0.35 sec
 ARIMA(0,1,2)(0,0,0)[0] intercept   : AIC=5329.688, Time=0.26 sec
 ARIMA(2,1,2)(0,0,0)[0] intercept   : AIC=5326.367, Time=0.60 sec
 ARIMA(1,1,3)(0,0,0)[0] intercept   : AIC=5326.367, Time=0.63 sec
 ARIMA(0,1,3)(0,0,0)[0] intercept   : AIC=5329.718, Time=0.38 sec
 ARIMA(2,1,3)(0,0,0)[0] intercept   : AIC=5327.488, Time=1.55 sec
 ARIMA(1,1,2)(0,0,0)[0]             : AIC=5322.402, Time=0.18 sec
 ARIMA(0,1,2)(0,0,0)[0]             : AIC=5327.724, Time=0.13 sec
 ARIMA(1,1,1)(0,0,0)[0]             : AIC=5328.602, Time=0.13 sec
 ARIMA(2,1,2)(0,0,0)[0]             : AIC=5324.401, Time=0.29 sec
 ARIMA(1,1,3)(0,0,0)[0]             : AIC=5324.401, Time=0.32 sec
 ARIMA(0,1,1)(0,0,0)[0]             : AIC=5334.458, Time=0.08 sec
 ARIMA(0,1,3)(0,0,0)[0]             : AIC=5327.751, Time=0.21 sec
 ARIMA(2,1,1)(0,0,0)[0]             : AIC=5330.021, Time=0.21 sec
 ARIMA(2,1,3)(0,0,0)[0]             : AIC=5325.521, Time=0.84 sec

Best model:  ARIMA(1,1,2)(0,0,0)[0]
Total fit time: 7.429 seconds
Performing stepwise search to minimize aic

/usr/local/lib/python3.10/dist-packages/statsmodels/tsa/base/
tsa_model.py:836: ValueWarning: No supported index is available.
Prediction results will be given with an integer index beginning at
`start`.
  return get_prediction_index(
/usr/local/lib/python3.10/dist-packages/statsmodels/tsa/base/tsa_model
.py:836: FutureWarning: No supported index is available. In the next
version, calling this method in a model without a supported index will
result in an exception.
  return get_prediction_index(

 ARIMA(1,1,1)(0,0,0)[0] intercept   : AIC=6055.062, Time=0.58 sec
 ARIMA(0,1,0)(0,0,0)[0] intercept   : AIC=6186.956, Time=0.04 sec
 ARIMA(1,1,0)(0,0,0)[0] intercept   : AIC=6142.507, Time=0.14 sec
 ARIMA(0,1,1)(0,0,0)[0] intercept   : AIC=6126.775, Time=0.23 sec
 ARIMA(0,1,0)(0,0,0)[0]             : AIC=6184.956, Time=0.03 sec
 ARIMA(2,1,1)(0,0,0)[0] intercept   : AIC=6052.432, Time=1.60 sec
```

```
 ARIMA(2,1,0)(0,0,0)[0] intercept   : AIC=6130.516, Time=0.78 sec
 ARIMA(3,1,1)(0,0,0)[0] intercept   : AIC=6054.416, Time=2.62 sec
 ARIMA(2,1,2)(0,0,0)[0] intercept   : AIC=6054.424, Time=1.65 sec
 ARIMA(1,1,2)(0,0,0)[0] intercept   : AIC=6052.500, Time=0.96 sec
 ARIMA(3,1,0)(0,0,0)[0] intercept   : AIC=6126.635, Time=0.35 sec
 ARIMA(3,1,2)(0,0,0)[0] intercept   : AIC=6055.311, Time=1.70 sec
 ARIMA(2,1,1)(0,0,0)[0]             : AIC=6050.433, Time=0.40 sec
 ARIMA(1,1,1)(0,0,0)[0]             : AIC=6053.062, Time=0.28 sec
 ARIMA(2,1,0)(0,0,0)[0]             : AIC=6128.517, Time=0.10 sec
 ARIMA(3,1,1)(0,0,0)[0]             : AIC=6052.417, Time=0.56 sec
 ARIMA(2,1,2)(0,0,0)[0]             : AIC=6052.424, Time=0.86 sec
 ARIMA(1,1,0)(0,0,0)[0]             : AIC=6140.507, Time=0.08 sec
 ARIMA(1,1,2)(0,0,0)[0]             : AIC=6050.500, Time=0.44 sec
 ARIMA(3,1,0)(0,0,0)[0]             : AIC=6124.636, Time=0.16 sec
 ARIMA(3,1,2)(0,0,0)[0]             : AIC=6053.311, Time=0.95 sec

Best model:  ARIMA(2,1,1)(0,0,0)[0]
Total fit time: 14.538 seconds
Performing stepwise search to minimize aic

/usr/local/lib/python3.10/dist-packages/statsmodels/tsa/base/
tsa_model.py:836: ValueWarning: No supported index is available.
Prediction results will be given with an integer index beginning at
`start`.
  return get_prediction_index(
/usr/local/lib/python3.10/dist-packages/statsmodels/tsa/base/tsa_model
.py:836: FutureWarning: No supported index is available. In the next
version, calling this method in a model without a supported index will
result in an exception.
  return get_prediction_index(

 ARIMA(1,1,1)(0,0,0)[0] intercept   : AIC=4447.122, Time=0.51 sec
 ARIMA(0,1,0)(0,0,0)[0] intercept   : AIC=4587.554, Time=0.04 sec
 ARIMA(1,1,0)(0,0,0)[0] intercept   : AIC=4573.463, Time=0.10 sec
 ARIMA(0,1,1)(0,0,0)[0] intercept   : AIC=4523.518, Time=0.14 sec
 ARIMA(0,1,0)(0,0,0)[0]             : AIC=4585.554, Time=0.03 sec
 ARIMA(2,1,1)(0,0,0)[0] intercept   : AIC=4437.726, Time=0.52 sec
 ARIMA(2,1,0)(0,0,0)[0] intercept   : AIC=4467.876, Time=1.05 sec
 ARIMA(3,1,1)(0,0,0)[0] intercept   : AIC=4411.310, Time=3.17 sec
 ARIMA(3,1,0)(0,0,0)[0] intercept   : AIC=4460.453, Time=0.24 sec
 ARIMA(3,1,2)(0,0,0)[0] intercept   : AIC=4413.067, Time=1.50 sec
 ARIMA(2,1,2)(0,0,0)[0] intercept   : AIC=4421.625, Time=0.50 sec
 ARIMA(3,1,1)(0,0,0)[0]             : AIC=4409.324, Time=0.36 sec
 ARIMA(2,1,1)(0,0,0)[0]             : AIC=4435.726, Time=0.22 sec
 ARIMA(3,1,0)(0,0,0)[0]             : AIC=4458.453, Time=0.12 sec
 ARIMA(3,1,2)(0,0,0)[0]             : AIC=4411.092, Time=0.68 sec
 ARIMA(2,1,0)(0,0,0)[0]             : AIC=4465.876, Time=0.12 sec
 ARIMA(2,1,2)(0,0,0)[0]             : AIC=4419.625, Time=0.21 sec

Best model:  ARIMA(3,1,1)(0,0,0)[0]
```

```
Total fit time: 9.535 seconds
Performing stepwise search to minimize aic
 ARIMA(1,0,1)(0,0,0)[0]                    : AIC=6885.345, Time=0.14 sec

/usr/local/lib/python3.10/dist-packages/statsmodels/tsa/base/
tsa_model.py:836: ValueWarning: No supported index is available.
Prediction results will be given with an integer index beginning at
`start`.
  return get_prediction_index(
/usr/local/lib/python3.10/dist-packages/statsmodels/tsa/base/tsa_model
.py:836: FutureWarning: No supported index is available. In the next
version, calling this method in a model without a supported index will
result in an exception.
  return get_prediction_index(

 ARIMA(0,0,0)(0,0,0)[0]                    : AIC=7347.712, Time=0.05 sec
 ARIMA(1,0,0)(0,0,0)[0]                    : AIC=6886.973, Time=0.07 sec
 ARIMA(0,0,1)(0,0,0)[0]                    : AIC=6994.878, Time=0.08 sec
 ARIMA(2,0,1)(0,0,0)[0]                    : AIC=6868.090, Time=0.28 sec
 ARIMA(2,0,0)(0,0,0)[0]                    : AIC=6886.030, Time=0.11 sec
 ARIMA(3,0,1)(0,0,0)[0]                    : AIC=6842.729, Time=0.33 sec
 ARIMA(3,0,0)(0,0,0)[0]                    : AIC=6881.471, Time=0.16 sec
 ARIMA(3,0,2)(0,0,0)[0]                    : AIC=6839.490, Time=0.43 sec
 ARIMA(2,0,2)(0,0,0)[0]                    : AIC=6852.652, Time=0.35 sec
 ARIMA(3,0,3)(0,0,0)[0]                    : AIC=6823.550, Time=0.48 sec
 ARIMA(2,0,3)(0,0,0)[0]                    : AIC=6822.784, Time=0.40 sec
 ARIMA(1,0,3)(0,0,0)[0]                    : AIC=6821.559, Time=0.28 sec
 ARIMA(0,0,3)(0,0,0)[0]                    : AIC=6834.776, Time=0.21 sec
 ARIMA(1,0,2)(0,0,0)[0]                    : AIC=6885.400, Time=0.23 sec
 ARIMA(0,0,2)(0,0,0)[0]                    : AIC=6977.278, Time=0.15 sec
 ARIMA(1,0,3)(0,0,0)[0] intercept   : AIC=6802.678, Time=0.98 sec
 ARIMA(0,0,3)(0,0,0)[0] intercept   : AIC=6809.079, Time=0.61 sec
 ARIMA(1,0,2)(0,0,0)[0] intercept   : AIC=6872.590, Time=0.72 sec
 ARIMA(2,0,3)(0,0,0)[0] intercept   : AIC=6804.671, Time=2.79 sec
 ARIMA(0,0,2)(0,0,0)[0] intercept   : AIC=6937.119, Time=1.63 sec
 ARIMA(2,0,2)(0,0,0)[0] intercept   : AIC=6840.276, Time=0.74 sec

Best model:  ARIMA(1,0,3)(0,0,0)[0] intercept
Total fit time: 11.283 seconds
Performing stepwise search to minimize aic

/usr/local/lib/python3.10/dist-packages/statsmodels/tsa/base/
tsa_model.py:836: ValueWarning: No supported index is available.
Prediction results will be given with an integer index beginning at
`start`.
  return get_prediction_index(
/usr/local/lib/python3.10/dist-packages/statsmodels/tsa/base/tsa_model
.py:836: FutureWarning: No supported index is available. In the next
version, calling this method in a model without a supported index will
```

```
result in an exception.
  return get_prediction_index(

 ARIMA(1,0,1)(0,0,0)[0]                    : AIC=2788.090, Time=0.26 sec
 ARIMA(0,0,0)(0,0,0)[0]                    : AIC=2986.114, Time=0.03 sec
 ARIMA(1,0,0)(0,0,0)[0]                    : AIC=2898.076, Time=0.05 sec
 ARIMA(0,0,1)(0,0,0)[0]                    : AIC=2927.444, Time=0.06 sec
 ARIMA(2,0,1)(0,0,0)[0]                    : AIC=2789.968, Time=0.30 sec
 ARIMA(1,0,2)(0,0,0)[0]                    : AIC=2789.976, Time=0.21 sec
 ARIMA(0,0,2)(0,0,0)[0]                    : AIC=2901.281, Time=0.10 sec
 ARIMA(2,0,0)(0,0,0)[0]                    : AIC=2854.032, Time=0.06 sec
 ARIMA(2,0,2)(0,0,0)[0]                    : AIC=2789.616, Time=0.44 sec
 ARIMA(1,0,1)(0,0,0)[0] intercept   : AIC=2779.525, Time=0.35 sec
 ARIMA(0,0,1)(0,0,0)[0] intercept   : AIC=2829.962, Time=0.16 sec
 ARIMA(1,0,0)(0,0,0)[0] intercept   : AIC=2822.864, Time=0.12 sec
 ARIMA(2,0,1)(0,0,0)[0] intercept   : AIC=2781.294, Time=0.50 sec
 ARIMA(1,0,2)(0,0,0)[0] intercept   : AIC=2781.284, Time=0.49 sec
 ARIMA(0,0,0)(0,0,0)[0] intercept   : AIC=2850.951, Time=0.03 sec
 ARIMA(0,0,2)(0,0,0)[0] intercept   : AIC=2819.814, Time=0.25 sec
 ARIMA(2,0,0)(0,0,0)[0] intercept   : AIC=2805.637, Time=0.17 sec
 ARIMA(2,0,2)(0,0,0)[0] intercept   : AIC=2781.497, Time=1.11 sec

Best model:  ARIMA(1,0,1)(0,0,0)[0] intercept
Total fit time: 4.711 seconds
Performing stepwise search to minimize aic
 ARIMA(1,0,1)(0,0,0)[0]                    : AIC=4445.993, Time=0.08 sec
 ARIMA(0,0,0)(0,0,0)[0]                    : AIC=4924.429, Time=0.03 sec

/usr/local/lib/python3.10/dist-packages/statsmodels/tsa/base/
tsa_model.py:836: ValueWarning: No supported index is available.
Prediction results will be given with an integer index beginning at
`start`.
  return get_prediction_index(
/usr/local/lib/python3.10/dist-packages/statsmodels/tsa/base/tsa_model
.py:836: FutureWarning: No supported index is available. In the next
version, calling this method in a model without a supported index will
result in an exception.
  return get_prediction_index(

 ARIMA(1,0,0)(0,0,0)[0]                    : AIC=4445.872, Time=0.06 sec
 ARIMA(0,0,1)(0,0,0)[0]                    : AIC=4632.906, Time=0.08 sec
 ARIMA(2,0,0)(0,0,0)[0]                    : AIC=4445.596, Time=0.08 sec
 ARIMA(3,0,0)(0,0,0)[0]                    : AIC=4442.784, Time=0.14 sec
 ARIMA(3,0,1)(0,0,0)[0]                    : AIC=4440.841, Time=0.22 sec
 ARIMA(2,0,1)(0,0,0)[0]                    : AIC=4441.529, Time=0.22 sec
 ARIMA(3,0,2)(0,0,0)[0]                    : AIC=4419.831, Time=0.77 sec
 ARIMA(2,0,2)(0,0,0)[0]                    : AIC=4439.211, Time=0.25 sec
 ARIMA(3,0,3)(0,0,0)[0]                    : AIC=4404.876, Time=0.93 sec
 ARIMA(2,0,3)(0,0,0)[0]                    : AIC=4403.013, Time=0.64 sec
 ARIMA(1,0,3)(0,0,0)[0]                    : AIC=4404.895, Time=0.30 sec
```

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 ARIMA(1,0,2)(0,0,0)[0]                 : AIC=4440.917, Time=0.16 sec
 ARIMA(2,0,3)(0,0,0)[0] intercept       : AIC=4400.105, Time=2.98 sec
 ARIMA(1,0,3)(0,0,0)[0] intercept       : AIC=4401.035, Time=2.15 sec
 ARIMA(2,0,2)(0,0,0)[0] intercept       : AIC=4409.793, Time=0.59 sec
 ARIMA(3,0,3)(0,0,0)[0] intercept       : AIC=4401.833, Time=1.58 sec
 ARIMA(1,0,2)(0,0,0)[0] intercept       : AIC=4408.628, Time=0.39 sec
 ARIMA(3,0,2)(0,0,0)[0] intercept       : AIC=4411.136, Time=1.01 sec

Best model:  ARIMA(2,0,3)(0,0,0)[0] intercept
Total fit time: 12.697 seconds
Performing stepwise search to minimize aic
 ARIMA(1,0,1)(0,0,0)[0]                 : AIC=2399.750, Time=0.08 sec
 ARIMA(0,0,0)(0,0,0)[0]                 : AIC=2628.635, Time=0.02 sec

/usr/local/lib/python3.10/dist-packages/statsmodels/tsa/base/
tsa_model.py:836: ValueWarning: No supported index is available.
Prediction results will be given with an integer index beginning at
`start`.
  return get_prediction_index(
/usr/local/lib/python3.10/dist-packages/statsmodels/tsa/base/tsa_model
.py:836: FutureWarning: No supported index is available. In the next
version, calling this method in a model without a supported index will
result in an exception.
  return get_prediction_index(

 ARIMA(1,0,0)(0,0,0)[0]                 : AIC=2397.762, Time=0.05 sec
 ARIMA(0,0,1)(0,0,0)[0]                 : AIC=2447.845, Time=0.06 sec
 ARIMA(2,0,0)(0,0,0)[0]                 : AIC=2399.752, Time=0.06 sec
 ARIMA(2,0,1)(0,0,0)[0]                 : AIC=2401.068, Time=0.19 sec
 ARIMA(1,0,0)(0,0,0)[0] intercept       : AIC=2391.078, Time=0.09 sec
 ARIMA(0,0,0)(0,0,0)[0] intercept       : AIC=2598.850, Time=0.03 sec
 ARIMA(2,0,0)(0,0,0)[0] intercept       : AIC=2392.852, Time=0.14 sec
 ARIMA(1,0,1)(0,0,0)[0] intercept       : AIC=2392.828, Time=0.15 sec
 ARIMA(0,0,1)(0,0,0)[0] intercept       : AIC=2430.537, Time=0.13 sec
 ARIMA(2,0,1)(0,0,0)[0] intercept       : AIC=2394.045, Time=0.43 sec

Best model:  ARIMA(1,0,0)(0,0,0)[0] intercept
Total fit time: 1.440 seconds
Warning: Invalid prediction range for item B09KDRMRLH. Skipping
forecast.
Performing stepwise search to minimize aic
 ARIMA(1,1,1)(0,0,0)[0] intercept       : AIC=3172.191, Time=0.25 sec
 ARIMA(0,1,0)(0,0,0)[0] intercept       : AIC=3349.287, Time=0.05 sec
 ARIMA(1,1,0)(0,0,0)[0] intercept       : AIC=3211.320, Time=0.09 sec
 ARIMA(0,1,1)(0,0,0)[0] intercept       : AIC=3171.388, Time=0.14 sec
 ARIMA(0,1,0)(0,0,0)[0]                 : AIC=3347.288, Time=0.03 sec
 ARIMA(0,1,2)(0,0,0)[0] intercept       : AIC=3172.543, Time=0.17 sec
 ARIMA(1,1,2)(0,0,0)[0] intercept       : AIC=3171.940, Time=0.72 sec
 ARIMA(0,1,1)(0,0,0)[0]                 : AIC=3169.389, Time=0.05 sec
 ARIMA(1,1,1)(0,0,0)[0]                 : AIC=3170.193, Time=0.11 sec
```

```
 ARIMA(0,1,2)(0,0,0)[0]               : AIC=3170.544, Time=0.09 sec
 ARIMA(1,1,0)(0,0,0)[0]               : AIC=3209.320, Time=0.05 sec
 ARIMA(1,1,2)(0,0,0)[0]               : AIC=3169.941, Time=0.34 sec

Best model:  ARIMA(0,1,1)(0,0,0)[0]
Total fit time: 2.097 seconds
Performing stepwise search to minimize aic

/usr/local/lib/python3.10/dist-packages/statsmodels/tsa/base/
tsa_model.py:836: ValueWarning: No supported index is available.
Prediction results will be given with an integer index beginning at
`start`.
  return get_prediction_index(
/usr/local/lib/python3.10/dist-packages/statsmodels/tsa/base/tsa_model
.py:836: FutureWarning: No supported index is available. In the next
version, calling this method in a model without a supported index will
result in an exception.
  return get_prediction_index(

 ARIMA(1,1,1)(0,0,0)[0] intercept    : AIC=3630.061, Time=0.35 sec
 ARIMA(0,1,0)(0,0,0)[0] intercept    : AIC=3828.327, Time=0.04 sec
 ARIMA(1,1,0)(0,0,0)[0] intercept    : AIC=3745.609, Time=0.10 sec
 ARIMA(0,1,1)(0,0,0)[0] intercept    : AIC=3643.074, Time=0.16 sec
 ARIMA(0,1,0)(0,0,0)[0]              : AIC=3826.327, Time=0.03 sec
 ARIMA(2,1,1)(0,0,0)[0] intercept    : AIC=3628.715, Time=0.36 sec
 ARIMA(2,1,0)(0,0,0)[0] intercept    : AIC=3672.103, Time=0.18 sec
 ARIMA(3,1,1)(0,0,0)[0] intercept    : AIC=3630.719, Time=0.43 sec
 ARIMA(2,1,2)(0,0,0)[0] intercept    : AIC=3630.709, Time=0.71 sec
 ARIMA(1,1,2)(0,0,0)[0] intercept    : AIC=3629.409, Time=2.05 sec
 ARIMA(3,1,0)(0,0,0)[0] intercept    : AIC=3637.373, Time=0.60 sec
 ARIMA(3,1,2)(0,0,0)[0] intercept    : AIC=3632.374, Time=1.70 sec
 ARIMA(2,1,1)(0,0,0)[0]              : AIC=3626.716, Time=0.14 sec
 ARIMA(1,1,1)(0,0,0)[0]              : AIC=3628.064, Time=0.13 sec
 ARIMA(2,1,0)(0,0,0)[0]              : AIC=3670.104, Time=0.10 sec
 ARIMA(3,1,1)(0,0,0)[0]              : AIC=3628.720, Time=0.21 sec
 ARIMA(2,1,2)(0,0,0)[0]              : AIC=3628.710, Time=0.28 sec
 ARIMA(1,1,0)(0,0,0)[0]              : AIC=3743.609, Time=0.06 sec
 ARIMA(1,1,2)(0,0,0)[0]              : AIC=3627.411, Time=0.18 sec
 ARIMA(3,1,0)(0,0,0)[0]              : AIC=3635.374, Time=0.10 sec
 ARIMA(3,1,2)(0,0,0)[0]              : AIC=3630.375, Time=0.48 sec

Best model:  ARIMA(2,1,1)(0,0,0)[0]
Total fit time: 8.423 seconds
Performing stepwise search to minimize aic

/usr/local/lib/python3.10/dist-packages/statsmodels/tsa/base/
tsa_model.py:836: ValueWarning: No supported index is available.
Prediction results will be given with an integer index beginning at
`start`.
  return get_prediction_index(
```

```
/usr/local/lib/python3.10/dist-packages/statsmodels/tsa/base/tsa_model
.py:836: FutureWarning: No supported index is available. In the next
version, calling this method in a model without a supported index will
result in an exception.
  return get_prediction_index(

 ARIMA(1,1,1)(0,0,0)[0] intercept   : AIC=inf, Time=1.15 sec
 ARIMA(0,1,0)(0,0,0)[0] intercept   : AIC=3442.225, Time=0.04 sec
 ARIMA(1,1,0)(0,0,0)[0] intercept   : AIC=3441.073, Time=0.08 sec
 ARIMA(0,1,1)(0,0,0)[0] intercept   : AIC=3422.475, Time=0.14 sec
 ARIMA(0,1,0)(0,0,0)[0]             : AIC=3440.225, Time=0.03 sec
 ARIMA(0,1,2)(0,0,0)[0] intercept   : AIC=3229.072, Time=0.25 sec
 ARIMA(1,1,2)(0,0,0)[0] intercept   : AIC=3224.688, Time=0.59 sec
 ARIMA(2,1,2)(0,0,0)[0] intercept   : AIC=inf, Time=0.87 sec
 ARIMA(1,1,3)(0,0,0)[0] intercept   : AIC=3219.864, Time=0.74 sec
 ARIMA(0,1,3)(0,0,0)[0] intercept   : AIC=3225.967, Time=0.63 sec
 ARIMA(2,1,3)(0,0,0)[0] intercept   : AIC=3221.727, Time=0.90 sec
 ARIMA(1,1,3)(0,0,0)[0]             : AIC=3217.865, Time=0.35 sec
 ARIMA(0,1,3)(0,0,0)[0]             : AIC=3224.126, Time=0.33 sec
 ARIMA(1,1,2)(0,0,0)[0]             : AIC=3222.968, Time=0.26 sec
 ARIMA(2,1,3)(0,0,0)[0]             : AIC=3219.727, Time=0.44 sec
 ARIMA(0,1,2)(0,0,0)[0]             : AIC=3227.072, Time=0.14 sec
 ARIMA(2,1,2)(0,0,0)[0]             : AIC=3223.252, Time=0.34 sec

Best model:  ARIMA(1,1,3)(0,0,0)[0]
Total fit time: 7.290 seconds
Performing stepwise search to minimize aic
 ARIMA(1,0,1)(0,0,0)[0]             : AIC=5402.652, Time=0.12 sec
 ARIMA(0,0,0)(0,0,0)[0]             : AIC=5858.120, Time=0.03 sec

/usr/local/lib/python3.10/dist-packages/statsmodels/tsa/base/
tsa_model.py:836: ValueWarning: No supported index is available.
Prediction results will be given with an integer index beginning at
`start`.
  return get_prediction_index(
/usr/local/lib/python3.10/dist-packages/statsmodels/tsa/base/tsa_model
.py:836: FutureWarning: No supported index is available. In the next
version, calling this method in a model without a supported index will
result in an exception.
  return get_prediction_index(

 ARIMA(1,0,0)(0,0,0)[0]             : AIC=5415.045, Time=0.07 sec
 ARIMA(0,0,1)(0,0,0)[0]             : AIC=5529.466, Time=0.12 sec
 ARIMA(2,0,1)(0,0,0)[0]             : AIC=inf, Time=1.67 sec
 ARIMA(1,0,2)(0,0,0)[0]             : AIC=5342.562, Time=0.64 sec
 ARIMA(0,0,2)(0,0,0)[0]             : AIC=5487.389, Time=0.24 sec
 ARIMA(2,0,2)(0,0,0)[0]             : AIC=5344.019, Time=1.20 sec
 ARIMA(1,0,3)(0,0,0)[0]             : AIC=5344.083, Time=0.70 sec
 ARIMA(0,0,3)(0,0,0)[0]             : AIC=5455.428, Time=0.23 sec
 ARIMA(2,0,3)(0,0,0)[0]             : AIC=5345.992, Time=0.51 sec
```

```
 ARIMA(1,0,2)(0,0,0)[0] intercept   : AIC=5337.785, Time=0.53 sec
 ARIMA(0,0,2)(0,0,0)[0] intercept   : AIC=5418.552, Time=0.36 sec
 ARIMA(1,0,1)(0,0,0)[0] intercept   : AIC=5383.319, Time=0.33 sec
 ARIMA(2,0,2)(0,0,0)[0] intercept   : AIC=5338.668, Time=0.72 sec
 ARIMA(1,0,3)(0,0,0)[0] intercept   : AIC=5338.704, Time=0.69 sec
 ARIMA(0,0,1)(0,0,0)[0] intercept   : AIC=5440.400, Time=0.21 sec
 ARIMA(0,0,3)(0,0,0)[0] intercept   : AIC=5398.310, Time=0.53 sec
 ARIMA(2,0,1)(0,0,0)[0] intercept   : AIC=5380.754, Time=0.57 sec
 ARIMA(2,0,3)(0,0,0)[0] intercept   : AIC=5340.666, Time=1.22 sec

Best model:  ARIMA(1,0,2)(0,0,0)[0] intercept
Total fit time: 10.734 seconds
Performing stepwise search to minimize aic

/usr/local/lib/python3.10/dist-packages/statsmodels/tsa/base/
tsa_model.py:836: ValueWarning: No supported index is available.
Prediction results will be given with an integer index beginning at
`start`.
  return get_prediction_index(
/usr/local/lib/python3.10/dist-packages/statsmodels/tsa/base/tsa_model
.py:836: FutureWarning: No supported index is available. In the next
version, calling this method in a model without a supported index will
result in an exception.
  return get_prediction_index(

 ARIMA(1,1,1)(0,0,0)[0] intercept   : AIC=4161.488, Time=0.24 sec
 ARIMA(0,1,0)(0,0,0)[0] intercept   : AIC=4362.779, Time=0.04 sec
 ARIMA(1,1,0)(0,0,0)[0] intercept   : AIC=4247.830, Time=0.11 sec
 ARIMA(0,1,1)(0,0,0)[0] intercept   : AIC=4160.493, Time=0.14 sec
 ARIMA(0,1,0)(0,0,0)[0]             : AIC=4360.779, Time=0.04 sec
 ARIMA(0,1,2)(0,0,0)[0] intercept   : AIC=4160.978, Time=0.22 sec
 ARIMA(1,1,2)(0,0,0)[0] intercept   : AIC=4158.765, Time=0.39 sec
 ARIMA(2,1,2)(0,0,0)[0] intercept   : AIC=4153.205, Time=0.47 sec
 ARIMA(2,1,1)(0,0,0)[0] intercept   : AIC=4151.613, Time=0.36 sec
 ARIMA(2,1,0)(0,0,0)[0] intercept   : AIC=4158.328, Time=0.16 sec
 ARIMA(3,1,1)(0,0,0)[0] intercept   : AIC=4151.813, Time=0.54 sec
 ARIMA(3,1,0)(0,0,0)[0] intercept   : AIC=4152.768, Time=0.22 sec
 ARIMA(3,1,2)(0,0,0)[0] intercept   : AIC=inf, Time=4.98 sec
 ARIMA(2,1,1)(0,0,0)[0]             : AIC=4149.622, Time=0.37 sec
 ARIMA(1,1,1)(0,0,0)[0]             : AIC=4159.503, Time=0.09 sec
 ARIMA(2,1,0)(0,0,0)[0]             : AIC=4156.333, Time=0.08 sec
 ARIMA(3,1,1)(0,0,0)[0]             : AIC=4149.828, Time=0.33 sec
 ARIMA(2,1,2)(0,0,0)[0]             : AIC=4151.216, Time=0.22 sec
 ARIMA(1,1,0)(0,0,0)[0]             : AIC=4245.830, Time=0.06 sec
 ARIMA(1,1,2)(0,0,0)[0]             : AIC=4156.781, Time=0.18 sec
 ARIMA(3,1,0)(0,0,0)[0]             : AIC=4150.775, Time=0.11 sec
 ARIMA(3,1,2)(0,0,0)[0]             : AIC=inf, Time=1.12 sec

Best model:  ARIMA(2,1,1)(0,0,0)[0]
Total fit time: 10.522 seconds
```

```
Performing stepwise search to minimize aic
 ARIMA(1,0,1)(0,0,0)[0]                   : AIC=4165.692, Time=0.11 sec
 ARIMA(0,0,0)(0,0,0)[0]                   : AIC=5387.164, Time=0.03 sec

/usr/local/lib/python3.10/dist-packages/statsmodels/tsa/base/
tsa_model.py:836: ValueWarning: No supported index is available.
Prediction results will be given with an integer index beginning at
`start`.
  return get_prediction_index(
/usr/local/lib/python3.10/dist-packages/statsmodels/tsa/base/tsa_model
.py:836: FutureWarning: No supported index is available. In the next
version, calling this method in a model without a supported index will
result in an exception.
  return get_prediction_index(

 ARIMA(1,0,0)(0,0,0)[0]                   : AIC=4208.015, Time=0.05 sec
 ARIMA(0,0,1)(0,0,0)[0]                   : AIC=4819.907, Time=0.09 sec
 ARIMA(2,0,1)(0,0,0)[0]                   : AIC=4167.365, Time=0.24 sec
 ARIMA(1,0,2)(0,0,0)[0]                   : AIC=4167.148, Time=0.18 sec
 ARIMA(0,0,2)(0,0,0)[0]                   : AIC=4629.177, Time=0.14 sec
 ARIMA(2,0,0)(0,0,0)[0]                   : AIC=4173.461, Time=0.08 sec
 ARIMA(2,0,2)(0,0,0)[0]                   : AIC=4159.215, Time=0.33 sec
 ARIMA(3,0,2)(0,0,0)[0]                   : AIC=4160.574, Time=0.41 sec
 ARIMA(2,0,3)(0,0,0)[0]                   : AIC=4160.393, Time=0.47 sec
 ARIMA(1,0,3)(0,0,0)[0]                   : AIC=4163.052, Time=0.15 sec
 ARIMA(3,0,1)(0,0,0)[0]                   : AIC=4160.504, Time=0.31 sec
 ARIMA(3,0,3)(0,0,0)[0]                   : AIC=4162.073, Time=0.58 sec
 ARIMA(2,0,2)(0,0,0)[0] intercept         : AIC=4152.529, Time=0.62 sec
 ARIMA(1,0,2)(0,0,0)[0] intercept         : AIC=4160.417, Time=0.37 sec
 ARIMA(2,0,1)(0,0,0)[0] intercept         : AIC=4160.517, Time=0.47 sec
 ARIMA(3,0,2)(0,0,0)[0] intercept         : AIC=4153.525, Time=0.94 sec
 ARIMA(2,0,3)(0,0,0)[0] intercept         : AIC=4153.112, Time=0.87 sec
 ARIMA(1,0,1)(0,0,0)[0] intercept         : AIC=4158.640, Time=0.25 sec
 ARIMA(1,0,3)(0,0,0)[0] intercept         : AIC=4154.491, Time=0.46 sec
 ARIMA(3,0,1)(0,0,0)[0] intercept         : AIC=4152.704, Time=1.26 sec
 ARIMA(3,0,3)(0,0,0)[0] intercept         : AIC=4154.126, Time=3.50 sec

Best model:  ARIMA(2,0,2)(0,0,0)[0] intercept
Total fit time: 11.957 seconds
Performing stepwise search to minimize aic

/usr/local/lib/python3.10/dist-packages/statsmodels/tsa/base/
tsa_model.py:836: ValueWarning: No supported index is available.
Prediction results will be given with an integer index beginning at
`start`.
  return get_prediction_index(
/usr/local/lib/python3.10/dist-packages/statsmodels/tsa/base/tsa_model
.py:836: FutureWarning: No supported index is available. In the next
version, calling this method in a model without a supported index will
```

```
result in an exception.
  return get_prediction_index(

 ARIMA(1,1,1)(0,0,0)[0] intercept   : AIC=5377.806, Time=0.40 sec
 ARIMA(0,1,0)(0,0,0)[0] intercept   : AIC=5717.002, Time=0.04 sec
 ARIMA(1,1,0)(0,0,0)[0] intercept   : AIC=5530.203, Time=0.12 sec
 ARIMA(0,1,1)(0,0,0)[0] intercept   : AIC=5376.684, Time=0.18 sec
 ARIMA(0,1,0)(0,0,0)[0]             : AIC=5715.002, Time=0.03 sec
 ARIMA(0,1,2)(0,0,0)[0] intercept   : AIC=5377.465, Time=0.27 sec
 ARIMA(1,1,2)(0,0,0)[0] intercept   : AIC=5369.490, Time=0.41 sec
 ARIMA(2,1,2)(0,0,0)[0] intercept   : AIC=5349.217, Time=0.57 sec
 ARIMA(2,1,1)(0,0,0)[0] intercept   : AIC=5352.346, Time=0.31 sec
 ARIMA(3,1,2)(0,0,0)[0] intercept   : AIC=inf, Time=1.74 sec
 ARIMA(2,1,3)(0,0,0)[0] intercept   : AIC=5347.779, Time=0.68 sec
 ARIMA(1,1,3)(0,0,0)[0] intercept   : AIC=5359.092, Time=0.63 sec
 ARIMA(3,1,3)(0,0,0)[0] intercept   : AIC=inf, Time=2.26 sec
 ARIMA(2,1,3)(0,0,0)[0]             : AIC=5345.781, Time=0.34 sec
 ARIMA(1,1,3)(0,0,0)[0]             : AIC=5357.094, Time=0.31 sec
 ARIMA(2,1,2)(0,0,0)[0]             : AIC=5347.218, Time=0.27 sec
 ARIMA(3,1,3)(0,0,0)[0]             : AIC=inf, Time=1.03 sec
 ARIMA(1,1,2)(0,0,0)[0]             : AIC=5367.493, Time=0.20 sec
 ARIMA(3,1,2)(0,0,0)[0]             : AIC=inf, Time=1.68 sec

Best model:  ARIMA(2,1,3)(0,0,0)[0]
Total fit time: 11.494 seconds
Performing stepwise search to minimize aic

/usr/local/lib/python3.10/dist-packages/statsmodels/tsa/base/
tsa_model.py:836: ValueWarning: No supported index is available.
Prediction results will be given with an integer index beginning at
`start`.
  return get_prediction_index(
/usr/local/lib/python3.10/dist-packages/statsmodels/tsa/base/tsa_model
.py:836: FutureWarning: No supported index is available. In the next
version, calling this method in a model without a supported index will
result in an exception.
  return get_prediction_index(

 ARIMA(1,1,1)(0,0,0)[0] intercept   : AIC=3364.240, Time=0.81 sec
 ARIMA(0,1,0)(0,0,0)[0] intercept   : AIC=3549.265, Time=0.07 sec
 ARIMA(1,1,0)(0,0,0)[0] intercept   : AIC=3401.332, Time=0.11 sec
 ARIMA(0,1,1)(0,0,0)[0] intercept   : AIC=3362.246, Time=0.29 sec
 ARIMA(0,1,0)(0,0,0)[0]             : AIC=3547.267, Time=0.09 sec
 ARIMA(0,1,2)(0,0,0)[0] intercept   : AIC=3364.242, Time=1.18 sec
 ARIMA(1,1,2)(0,0,0)[0] intercept   : AIC=3366.190, Time=0.85 sec
 ARIMA(0,1,1)(0,0,0)[0]             : AIC=3360.248, Time=0.06 sec
 ARIMA(1,1,1)(0,0,0)[0]             : AIC=3362.242, Time=0.11 sec
 ARIMA(0,1,2)(0,0,0)[0]             : AIC=3362.244, Time=0.09 sec
 ARIMA(1,1,0)(0,0,0)[0]             : AIC=3399.334, Time=0.07 sec
 ARIMA(1,1,2)(0,0,0)[0]             : AIC=3364.192, Time=0.36 sec
```

```
Best model:  ARIMA(0,1,1)(0,0,0)[0]
Total fit time: 4.132 seconds
Performing stepwise search to minimize aic
 ARIMA(1,0,1)(0,0,0)[0]             : AIC=2777.659, Time=0.10 sec
 ARIMA(0,0,0)(0,0,0)[0]             : AIC=2964.098, Time=0.02 sec

/usr/local/lib/python3.10/dist-packages/statsmodels/tsa/base/
tsa_model.py:836: ValueWarning: No supported index is available.
Prediction results will be given with an integer index beginning at
`start`.
   return get_prediction_index(
/usr/local/lib/python3.10/dist-packages/statsmodels/tsa/base/tsa_model
.py:836: FutureWarning: No supported index is available. In the next
version, calling this method in a model without a supported index will
result in an exception.
   return get_prediction_index(

 ARIMA(1,0,0)(0,0,0)[0]             : AIC=2775.760, Time=0.05 sec
 ARIMA(0,0,1)(0,0,0)[0]             : AIC=2797.182, Time=0.06 sec
 ARIMA(2,0,0)(0,0,0)[0]             : AIC=2777.737, Time=0.06 sec
 ARIMA(2,0,1)(0,0,0)[0]             : AIC=2774.111, Time=0.19 sec
 ARIMA(3,0,1)(0,0,0)[0]             : AIC=2738.074, Time=0.40 sec
 ARIMA(3,0,0)(0,0,0)[0]             : AIC=2755.113, Time=0.08 sec
 ARIMA(3,0,2)(0,0,0)[0]             : AIC=2733.274, Time=0.49 sec
 ARIMA(2,0,2)(0,0,0)[0]             : AIC=2733.045, Time=0.33 sec
 ARIMA(1,0,2)(0,0,0)[0]             : AIC=2731.072, Time=0.24 sec
 ARIMA(0,0,2)(0,0,0)[0]             : AIC=2790.292, Time=0.07 sec
 ARIMA(1,0,3)(0,0,0)[0]             : AIC=2733.053, Time=0.35 sec
 ARIMA(0,0,3)(0,0,0)[0]             : AIC=2778.572, Time=0.11 sec
 ARIMA(2,0,3)(0,0,0)[0]             : AIC=2734.438, Time=0.82 sec
 ARIMA(1,0,2)(0,0,0)[0] intercept   : AIC=2729.262, Time=0.58 sec
 ARIMA(0,0,2)(0,0,0)[0] intercept   : AIC=2744.256, Time=0.17 sec
 ARIMA(1,0,1)(0,0,0)[0] intercept   : AIC=2742.686, Time=0.25 sec
 ARIMA(2,0,2)(0,0,0)[0] intercept   : AIC=2730.928, Time=0.96 sec
 ARIMA(1,0,3)(0,0,0)[0] intercept   : AIC=2731.025, Time=0.70 sec
 ARIMA(0,0,1)(0,0,0)[0] intercept   : AIC=2744.337, Time=0.12 sec
 ARIMA(0,0,3)(0,0,0)[0] intercept   : AIC=2739.791, Time=0.26 sec
 ARIMA(2,0,1)(0,0,0)[0] intercept   : AIC=2739.901, Time=0.37 sec
 ARIMA(2,0,3)(0,0,0)[0] intercept   : AIC=2732.764, Time=1.03 sec

Best model:  ARIMA(1,0,2)(0,0,0)[0] intercept
Total fit time: 7.824 seconds
Warning: Invalid prediction range for item B09MR6BMJ3. Skipping
forecast.
Performing stepwise search to minimize aic
 ARIMA(1,0,1)(0,0,0)[0]             : AIC=1203.655, Time=0.20 sec
 ARIMA(0,0,0)(0,0,0)[0]             : AIC=1214.986, Time=0.04 sec
 ARIMA(1,0,0)(0,0,0)[0]             : AIC=1213.197, Time=0.04 sec
 ARIMA(0,0,1)(0,0,0)[0]             : AIC=1213.651, Time=0.04 sec
```

```
 ARIMA(2,0,1)(0,0,0)[0]               : AIC=1205.098, Time=0.31 sec
 ARIMA(1,0,2)(0,0,0)[0]               : AIC=1205.123, Time=0.64 sec
 ARIMA(0,0,2)(0,0,0)[0]               : AIC=1213.874, Time=0.53 sec
 ARIMA(2,0,0)(0,0,0)[0]               : AIC=1213.042, Time=0.13 sec
 ARIMA(2,0,2)(0,0,0)[0]               : AIC=1206.806, Time=1.25 sec
 ARIMA(1,0,1)(0,0,0)[0] intercept     : AIC=1200.017, Time=1.52 sec
 ARIMA(0,0,1)(0,0,0)[0] intercept     : AIC=1199.732, Time=0.18 sec
 ARIMA(0,0,0)(0,0,0)[0] intercept     : AIC=1198.954, Time=0.14 sec
 ARIMA(1,0,0)(0,0,0)[0] intercept     : AIC=1199.645, Time=0.05 sec

Best model:  ARIMA(0,0,0)(0,0,0)[0] intercept
Total fit time: 5.109 seconds
Warning: Invalid prediction range for item B09X1J3WBF. Skipping
forecast.
Performing stepwise search to minimize aic
 ARIMA(1,1,1)(0,0,0)[0] intercept     : AIC=3429.286, Time=0.20 sec
 ARIMA(0,1,0)(0,0,0)[0] intercept     : AIC=3555.209, Time=0.04 sec
 ARIMA(1,1,0)(0,0,0)[0] intercept     : AIC=3429.044, Time=0.11 sec
 ARIMA(0,1,1)(0,0,0)[0] intercept     : AIC=3431.923, Time=0.14 sec
 ARIMA(0,1,0)(0,0,0)[0]               : AIC=3553.209, Time=0.04 sec
 ARIMA(2,1,0)(0,0,0)[0] intercept     : AIC=3429.883, Time=0.16 sec
 ARIMA(2,1,1)(0,0,0)[0] intercept     : AIC=inf, Time=1.79 sec
 ARIMA(1,1,0)(0,0,0)[0]               : AIC=3427.045, Time=0.05 sec
 ARIMA(2,1,0)(0,0,0)[0]               : AIC=3427.884, Time=0.10 sec
 ARIMA(1,1,1)(0,0,0)[0]               : AIC=3427.287, Time=0.09 sec
 ARIMA(0,1,1)(0,0,0)[0]               : AIC=3429.925, Time=0.06 sec
 ARIMA(2,1,1)(0,0,0)[0]               : AIC=inf, Time=0.43 sec

Best model:  ARIMA(1,1,0)(0,0,0)[0]
Total fit time: 3.211 seconds
Performing stepwise search to minimize aic

/usr/local/lib/python3.10/dist-packages/statsmodels/tsa/base/
tsa_model.py:836: ValueWarning: No supported index is available.
Prediction results will be given with an integer index beginning at
`start`.
  return get_prediction_index(
/usr/local/lib/python3.10/dist-packages/statsmodels/tsa/base/tsa_model
.py:836: FutureWarning: No supported index is available. In the next
version, calling this method in a model without a supported index will
result in an exception.
  return get_prediction_index(

 ARIMA(1,1,1)(0,0,0)[0] intercept     : AIC=5061.119, Time=0.41 sec
 ARIMA(0,1,0)(0,0,0)[0] intercept     : AIC=5245.139, Time=0.04 sec
 ARIMA(1,1,0)(0,0,0)[0] intercept     : AIC=5236.187, Time=0.11 sec
 ARIMA(0,1,1)(0,0,0)[0] intercept     : AIC=5183.478, Time=0.18 sec
 ARIMA(0,1,0)(0,0,0)[0]               : AIC=5243.139, Time=0.03 sec
 ARIMA(2,1,1)(0,0,0)[0] intercept     : AIC=5032.330, Time=0.51 sec
 ARIMA(2,1,0)(0,0,0)[0] intercept     : AIC=5128.569, Time=0.22 sec
```

```
ARIMA(3,1,1)(0,0,0)[0] intercept   : AIC=5024.774, Time=0.57 sec
ARIMA(3,1,0)(0,0,0)[0] intercept   : AIC=5116.073, Time=0.29 sec
ARIMA(3,1,2)(0,0,0)[0] intercept   : AIC=5000.169, Time=0.92 sec
ARIMA(2,1,2)(0,0,0)[0] intercept   : AIC=4999.251, Time=0.61 sec
ARIMA(1,1,2)(0,0,0)[0] intercept   : AIC=5006.642, Time=0.42 sec
ARIMA(2,1,3)(0,0,0)[0] intercept   : AIC=5000.447, Time=0.85 sec
ARIMA(1,1,3)(0,0,0)[0] intercept   : AIC=5000.847, Time=0.65 sec
ARIMA(3,1,3)(0,0,0)[0] intercept   : AIC=5002.160, Time=3.50 sec
ARIMA(2,1,2)(0,0,0)[0]             : AIC=4997.258, Time=1.69 sec
ARIMA(1,1,2)(0,0,0)[0]             : AIC=5004.645, Time=0.19 sec
ARIMA(2,1,1)(0,0,0)[0]             : AIC=5030.333, Time=0.21 sec
ARIMA(3,1,2)(0,0,0)[0]             : AIC=4998.174, Time=0.52 sec
ARIMA(2,1,3)(0,0,0)[0]             : AIC=4998.453, Time=0.50 sec
ARIMA(1,1,1)(0,0,0)[0]             : AIC=5059.129, Time=0.15 sec
ARIMA(1,1,3)(0,0,0)[0]             : AIC=4998.851, Time=0.38 sec
ARIMA(3,1,1)(0,0,0)[0]             : AIC=5022.781, Time=0.30 sec
ARIMA(3,1,3)(0,0,0)[0]             : AIC=5000.165, Time=0.97 sec

Best model:  ARIMA(2,1,2)(0,0,0)[0]
Total fit time: 14.250 seconds
Performing stepwise search to minimize aic

/usr/local/lib/python3.10/dist-packages/statsmodels/tsa/base/
tsa_model.py:836: ValueWarning: No supported index is available.
Prediction results will be given with an integer index beginning at
`start`.
  return get_prediction_index(
/usr/local/lib/python3.10/dist-packages/statsmodels/tsa/base/tsa_model
.py:836: FutureWarning: No supported index is available. In the next
version, calling this method in a model without a supported index will
result in an exception.
  return get_prediction_index(

ARIMA(1,1,1)(0,0,0)[0] intercept   : AIC=4500.420, Time=0.31 sec
ARIMA(0,1,0)(0,0,0)[0] intercept   : AIC=4874.168, Time=0.04 sec
ARIMA(1,1,0)(0,0,0)[0] intercept   : AIC=4690.750, Time=0.10 sec
ARIMA(0,1,1)(0,0,0)[0] intercept   : AIC=4499.209, Time=0.19 sec
ARIMA(0,1,0)(0,0,0)[0]             : AIC=4872.168, Time=0.04 sec
ARIMA(0,1,2)(0,0,0)[0] intercept   : AIC=4500.157, Time=0.24 sec
ARIMA(1,1,2)(0,0,0)[0] intercept   : AIC=4495.777, Time=0.45 sec
ARIMA(2,1,2)(0,0,0)[0] intercept   : AIC=4483.741, Time=0.62 sec
ARIMA(2,1,1)(0,0,0)[0] intercept   : AIC=4491.324, Time=0.35 sec
ARIMA(3,1,2)(0,0,0)[0] intercept   : AIC=4480.441, Time=0.98 sec
ARIMA(3,1,1)(0,0,0)[0] intercept   : AIC=4478.592, Time=0.72 sec
ARIMA(3,1,0)(0,0,0)[0] intercept   : AIC=4513.046, Time=0.26 sec
ARIMA(2,1,0)(0,0,0)[0] intercept   : AIC=4524.528, Time=0.21 sec
ARIMA(3,1,1)(0,0,0)[0]             : AIC=4476.615, Time=0.28 sec
ARIMA(2,1,1)(0,0,0)[0]             : AIC=4489.333, Time=0.15 sec
ARIMA(3,1,0)(0,0,0)[0]             : AIC=4511.049, Time=0.13 sec
ARIMA(3,1,2)(0,0,0)[0]             : AIC=4478.461, Time=0.43 sec
```

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 ARIMA(2,1,0)(0,0,0)[0]                 : AIC=4522.529, Time=0.10 sec
 ARIMA(2,1,2)(0,0,0)[0]                 : AIC=4481.753, Time=0.30 sec

Best model:  ARIMA(3,1,1)(0,0,0)[0]
Total fit time: 5.924 seconds
Performing stepwise search to minimize aic

/usr/local/lib/python3.10/dist-packages/statsmodels/tsa/base/
tsa_model.py:836: ValueWarning: No supported index is available.
Prediction results will be given with an integer index beginning at
`start`.
  return get_prediction_index(
/usr/local/lib/python3.10/dist-packages/statsmodels/tsa/base/tsa_model
.py:836: FutureWarning: No supported index is available. In the next
version, calling this method in a model without a supported index will
result in an exception.
  return get_prediction_index(

 ARIMA(1,1,1)(0,0,0)[0] intercept   : AIC=2999.820, Time=0.47 sec
 ARIMA(0,1,0)(0,0,0)[0] intercept   : AIC=3255.583, Time=0.04 sec
 ARIMA(1,1,0)(0,0,0)[0] intercept   : AIC=3123.845, Time=0.09 sec
 ARIMA(0,1,1)(0,0,0)[0] intercept   : AIC=3044.283, Time=0.32 sec
 ARIMA(0,1,0)(0,0,0)[0]             : AIC=3253.584, Time=0.06 sec
 ARIMA(2,1,1)(0,0,0)[0] intercept   : AIC=2989.502, Time=2.72 sec
 ARIMA(2,1,0)(0,0,0)[0] intercept   : AIC=3082.310, Time=0.78 sec
 ARIMA(3,1,1)(0,0,0)[0] intercept   : AIC=2988.841, Time=1.58 sec
 ARIMA(3,1,0)(0,0,0)[0] intercept   : AIC=3082.428, Time=0.26 sec
 ARIMA(3,1,2)(0,0,0)[0] intercept   : AIC=2983.995, Time=1.37 sec
 ARIMA(2,1,2)(0,0,0)[0] intercept   : AIC=3003.554, Time=0.99 sec
 ARIMA(3,1,3)(0,0,0)[0] intercept   : AIC=2983.506, Time=2.13 sec
 ARIMA(2,1,3)(0,0,0)[0] intercept   : AIC=2990.961, Time=2.30 sec
 ARIMA(3,1,3)(0,0,0)[0]             : AIC=2981.498, Time=0.88 sec
 ARIMA(2,1,3)(0,0,0)[0]             : AIC=2988.970, Time=0.76 sec
 ARIMA(3,1,2)(0,0,0)[0]             : AIC=2982.004, Time=1.66 sec
 ARIMA(2,1,2)(0,0,0)[0]             : AIC=3001.554, Time=1.25 sec

Best model:  ARIMA(3,1,3)(0,0,0)[0]
Total fit time: 17.712 seconds
Performing stepwise search to minimize aic

/usr/local/lib/python3.10/dist-packages/statsmodels/tsa/base/
tsa_model.py:836: ValueWarning: No supported index is available.
Prediction results will be given with an integer index beginning at
`start`.
  return get_prediction_index(
/usr/local/lib/python3.10/dist-packages/statsmodels/tsa/base/tsa_model
.py:836: FutureWarning: No supported index is available. In the next
version, calling this method in a model without a supported index will
result in an exception.
  return get_prediction_index(
```

```
 ARIMA(1,0,1)(0,0,0)[0]                 : AIC=4456.031, Time=1.05 sec
 ARIMA(0,0,0)(0,0,0)[0]                 : AIC=4593.308, Time=0.02 sec
 ARIMA(1,0,0)(0,0,0)[0]                 : AIC=4462.493, Time=0.05 sec
 ARIMA(0,0,1)(0,0,0)[0]                 : AIC=4456.018, Time=0.06 sec
 ARIMA(0,0,2)(0,0,0)[0]                 : AIC=4456.715, Time=0.10 sec
 ARIMA(1,0,2)(0,0,0)[0]                 : AIC=4439.387, Time=0.48 sec
 ARIMA(2,0,2)(0,0,0)[0]                 : AIC=inf, Time=0.93 sec
 ARIMA(1,0,3)(0,0,0)[0]                 : AIC=inf, Time=0.75 sec
 ARIMA(0,0,3)(0,0,0)[0]                 : AIC=4454.163, Time=0.11 sec
 ARIMA(2,0,1)(0,0,0)[0]                 : AIC=4454.008, Time=0.18 sec
 ARIMA(2,0,3)(0,0,0)[0]                 : AIC=4443.254, Time=0.56 sec
 ARIMA(1,0,2)(0,0,0)[0] intercept       : AIC=4434.087, Time=0.59 sec
 ARIMA(0,0,2)(0,0,0)[0] intercept       : AIC=4435.055, Time=0.28 sec
 ARIMA(1,0,1)(0,0,0)[0] intercept       : AIC=4435.019, Time=0.25 sec
 ARIMA(2,0,2)(0,0,0)[0] intercept       : AIC=4435.021, Time=0.73 sec
 ARIMA(1,0,3)(0,0,0)[0] intercept       : AIC=4435.046, Time=0.65 sec
 ARIMA(0,0,1)(0,0,0)[0] intercept       : AIC=4433.169, Time=0.16 sec
 ARIMA(0,0,0)(0,0,0)[0] intercept       : AIC=4552.368, Time=0.04 sec
 ARIMA(1,0,0)(0,0,0)[0] intercept       : AIC=4446.237, Time=0.12 sec

Best model:  ARIMA(0,0,1)(0,0,0)[0] intercept
Total fit time: 7.161 seconds
Performing stepwise search to minimize aic
 ARIMA(1,0,1)(0,0,0)[0]                 : AIC=3868.139, Time=0.11 sec
 ARIMA(0,0,0)(0,0,0)[0]                 : AIC=4523.193, Time=0.02 sec

/usr/local/lib/python3.10/dist-packages/statsmodels/tsa/base/
tsa_model.py:836: ValueWarning: No supported index is available.
Prediction results will be given with an integer index beginning at
`start`.
  return get_prediction_index(
/usr/local/lib/python3.10/dist-packages/statsmodels/tsa/base/tsa_model
.py:836: FutureWarning: No supported index is available. In the next
version, calling this method in a model without a supported index will
result in an exception.
  return get_prediction_index(

 ARIMA(1,0,0)(0,0,0)[0]                 : AIC=3945.811, Time=0.06 sec
 ARIMA(0,0,1)(0,0,0)[0]                 : AIC=4159.671, Time=0.08 sec
 ARIMA(2,0,1)(0,0,0)[0]                 : AIC=3868.788, Time=0.21 sec
 ARIMA(1,0,2)(0,0,0)[0]                 : AIC=3861.525, Time=0.13 sec
 ARIMA(0,0,2)(0,0,0)[0]                 : AIC=4124.614, Time=0.13 sec
 ARIMA(2,0,2)(0,0,0)[0]                 : AIC=3849.463, Time=0.27 sec
 ARIMA(3,0,2)(0,0,0)[0]                 : AIC=3778.708, Time=0.28 sec
 ARIMA(3,0,1)(0,0,0)[0]                 : AIC=3791.299, Time=0.18 sec
 ARIMA(3,0,3)(0,0,0)[0]                 : AIC=3772.175, Time=0.38 sec
 ARIMA(2,0,3)(0,0,0)[0]                 : AIC=3785.096, Time=0.26 sec
 ARIMA(3,0,3)(0,0,0)[0] intercept       : AIC=3766.500, Time=0.91 sec
 ARIMA(2,0,3)(0,0,0)[0] intercept       : AIC=3777.932, Time=0.45 sec
 ARIMA(3,0,2)(0,0,0)[0] intercept       : AIC=3774.302, Time=1.60 sec
```

```
 ARIMA(2,0,2)(0,0,0)[0] intercept   : AIC=3845.507, Time=1.46 sec

Best model:  ARIMA(3,0,3)(0,0,0)[0] intercept
Total fit time: 6.553 seconds
Performing stepwise search to minimize aic

/usr/local/lib/python3.10/dist-packages/statsmodels/tsa/base/
tsa_model.py:836: ValueWarning: No supported index is available.
Prediction results will be given with an integer index beginning at
`start`.
  return get_prediction_index(
/usr/local/lib/python3.10/dist-packages/statsmodels/tsa/base/tsa_model
.py:836: FutureWarning: No supported index is available. In the next
version, calling this method in a model without a supported index will
result in an exception.
  return get_prediction_index(

 ARIMA(1,0,1)(0,0,0)[0]             : AIC=1954.997, Time=1.45 sec
 ARIMA(0,0,0)(0,0,0)[0]             : AIC=2169.902, Time=0.04 sec
 ARIMA(1,0,0)(0,0,0)[0]             : AIC=2019.319, Time=0.04 sec
 ARIMA(0,0,1)(0,0,0)[0]             : AIC=2072.953, Time=0.05 sec
 ARIMA(2,0,1)(0,0,0)[0]             : AIC=1956.572, Time=0.23 sec
 ARIMA(1,0,2)(0,0,0)[0]             : AIC=1956.401, Time=0.12 sec
 ARIMA(0,0,2)(0,0,0)[0]             : AIC=2046.238, Time=0.07 sec
 ARIMA(2,0,0)(0,0,0)[0]             : AIC=1980.641, Time=0.08 sec
 ARIMA(2,0,2)(0,0,0)[0]             : AIC=1954.681, Time=0.22 sec
 ARIMA(3,0,2)(0,0,0)[0]             : AIC=1950.548, Time=0.25 sec
 ARIMA(3,0,1)(0,0,0)[0]             : AIC=1952.110, Time=0.19 sec
 ARIMA(3,0,3)(0,0,0)[0]             : AIC=1952.475, Time=0.31 sec
 ARIMA(2,0,3)(0,0,0)[0]             : AIC=1950.551, Time=0.24 sec
 ARIMA(3,0,2)(0,0,0)[0] intercept   : AIC=1943.536, Time=0.55 sec
 ARIMA(2,0,2)(0,0,0)[0] intercept   : AIC=1949.135, Time=0.43 sec
 ARIMA(3,0,1)(0,0,0)[0] intercept   : AIC=1944.326, Time=0.30 sec
 ARIMA(3,0,3)(0,0,0)[0] intercept   : AIC=1944.082, Time=0.63 sec
 ARIMA(2,0,1)(0,0,0)[0] intercept   : AIC=1950.321, Time=0.50 sec
 ARIMA(2,0,3)(0,0,0)[0] intercept   : AIC=1942.385, Time=0.48 sec
 ARIMA(1,0,3)(0,0,0)[0] intercept   : AIC=1942.771, Time=0.27 sec
 ARIMA(1,0,2)(0,0,0)[0] intercept   : AIC=1949.862, Time=0.29 sec

Best model:  ARIMA(2,0,3)(0,0,0)[0] intercept
Total fit time: 6.780 seconds
Performing stepwise search to minimize aic
 ARIMA(1,0,1)(0,0,0)[0]             : AIC=2507.730, Time=0.12 sec
 ARIMA(0,0,0)(0,0,0)[0]             : AIC=2599.369, Time=0.02 sec

/usr/local/lib/python3.10/dist-packages/statsmodels/tsa/base/
tsa_model.py:836: ValueWarning: No supported index is available.
Prediction results will be given with an integer index beginning at
`start`.
  return get_prediction_index(
```

```
/usr/local/lib/python3.10/dist-packages/statsmodels/tsa/base/tsa_model
.py:836: FutureWarning: No supported index is available. In the next
version, calling this method in a model without a supported index will
result in an exception.
  return get_prediction_index(

 ARIMA(1,0,0)(0,0,0)[0]                : AIC=2533.619, Time=0.04 sec
 ARIMA(0,0,1)(0,0,0)[0]                : AIC=2553.287, Time=0.05 sec
 ARIMA(2,0,1)(0,0,0)[0]                : AIC=2508.868, Time=0.20 sec
 ARIMA(1,0,2)(0,0,0)[0]                : AIC=2508.529, Time=0.11 sec
 ARIMA(0,0,2)(0,0,0)[0]                : AIC=2536.673, Time=0.08 sec
 ARIMA(2,0,0)(0,0,0)[0]                : AIC=2514.010, Time=0.06 sec
 ARIMA(2,0,2)(0,0,0)[0]                : AIC=2509.865, Time=0.22 sec
 ARIMA(1,0,1)(0,0,0)[0] intercept      : AIC=2502.283, Time=0.22 sec
 ARIMA(0,0,1)(0,0,0)[0] intercept      : AIC=2534.855, Time=0.11 sec
 ARIMA(1,0,0)(0,0,0)[0] intercept      : AIC=2520.715, Time=0.09 sec
 ARIMA(2,0,1)(0,0,0)[0] intercept      : AIC=2503.040, Time=0.31 sec
 ARIMA(1,0,2)(0,0,0)[0] intercept      : AIC=2502.437, Time=0.29 sec
 ARIMA(0,0,0)(0,0,0)[0] intercept      : AIC=2571.998, Time=0.03 sec
 ARIMA(0,0,2)(0,0,0)[0] intercept      : AIC=2521.873, Time=0.21 sec
 ARIMA(2,0,0)(0,0,0)[0] intercept      : AIC=2505.805, Time=0.12 sec
 ARIMA(2,0,2)(0,0,0)[0] intercept      : AIC=2502.379, Time=0.85 sec

Best model:  ARIMA(1,0,1)(0,0,0)[0] intercept
Total fit time: 3.146 seconds
Warning: Invalid prediction range for item B09KF1P32N. Skipping
forecast.
Performing stepwise search to minimize aic
 ARIMA(1,0,1)(0,0,0)[0]                : AIC=7596.478, Time=0.29 sec
 ARIMA(0,0,0)(0,0,0)[0]                : AIC=7772.595, Time=0.02 sec
 ARIMA(1,0,0)(0,0,0)[0]                : AIC=7691.943, Time=0.08 sec
 ARIMA(0,0,1)(0,0,0)[0]                : AIC=7715.906, Time=0.10 sec
 ARIMA(2,0,1)(0,0,0)[0]                : AIC=7594.124, Time=0.26 sec
 ARIMA(2,0,0)(0,0,0)[0]                : AIC=7651.030, Time=0.06 sec
 ARIMA(3,0,1)(0,0,0)[0]                : AIC=7573.270, Time=0.34 sec
 ARIMA(3,0,0)(0,0,0)[0]                : AIC=7574.777, Time=0.17 sec
 ARIMA(3,0,2)(0,0,0)[0]                : AIC=7575.267, Time=1.14 sec
 ARIMA(2,0,2)(0,0,0)[0]                : AIC=7590.275, Time=1.39 sec
 ARIMA(3,0,1)(0,0,0)[0] intercept      : AIC=7569.579, Time=2.34 sec
 ARIMA(2,0,1)(0,0,0)[0] intercept      : AIC=7591.546, Time=0.61 sec
 ARIMA(3,0,0)(0,0,0)[0] intercept      : AIC=7570.131, Time=0.40 sec
 ARIMA(3,0,2)(0,0,0)[0] intercept      : AIC=7571.498, Time=1.39 sec
 ARIMA(2,0,0)(0,0,0)[0] intercept      : AIC=7640.294, Time=0.12 sec
 ARIMA(2,0,2)(0,0,0)[0] intercept      : AIC=7585.985, Time=0.89 sec

Best model:  ARIMA(3,0,1)(0,0,0)[0] intercept
Total fit time: 9.649 seconds
Performing stepwise search to minimize aic
```

```
/usr/local/lib/python3.10/dist-packages/statsmodels/tsa/base/
tsa_model.py:836: ValueWarning: No supported index is available.
Prediction results will be given with an integer index beginning at
`start`.
  return get_prediction_index(
/usr/local/lib/python3.10/dist-packages/statsmodels/tsa/base/tsa_model
.py:836: FutureWarning: No supported index is available. In the next
version, calling this method in a model without a supported index will
result in an exception.
  return get_prediction_index(

 ARIMA(1,0,1)(0,0,0)[0]             : AIC=5892.390, Time=0.20 sec
 ARIMA(0,0,0)(0,0,0)[0]             : AIC=5906.547, Time=0.02 sec
 ARIMA(1,0,0)(0,0,0)[0]             : AIC=5904.122, Time=0.07 sec
 ARIMA(0,0,1)(0,0,0)[0]             : AIC=5904.584, Time=0.09 sec
 ARIMA(2,0,1)(0,0,0)[0]             : AIC=5894.388, Time=0.31 sec
 ARIMA(1,0,2)(0,0,0)[0]             : AIC=5894.388, Time=0.30 sec
 ARIMA(0,0,2)(0,0,0)[0]             : AIC=5904.706, Time=0.27 sec
 ARIMA(2,0,0)(0,0,0)[0]             : AIC=5903.161, Time=0.11 sec
 ARIMA(2,0,2)(0,0,0)[0]             : AIC=5895.541, Time=0.46 sec
 ARIMA(1,0,1)(0,0,0)[0] intercept   : AIC=5888.354, Time=0.59 sec
 ARIMA(0,0,1)(0,0,0)[0] intercept   : AIC=5893.256, Time=0.29 sec
 ARIMA(1,0,0)(0,0,0)[0] intercept   : AIC=5893.060, Time=0.13 sec
 ARIMA(2,0,1)(0,0,0)[0] intercept   : AIC=5890.055, Time=0.66 sec
 ARIMA(1,0,2)(0,0,0)[0] intercept   : AIC=5890.006, Time=0.61 sec
 ARIMA(0,0,0)(0,0,0)[0] intercept   : AIC=5893.553, Time=0.04 sec
 ARIMA(0,0,2)(0,0,0)[0] intercept   : AIC=5894.229, Time=0.39 sec
 ARIMA(2,0,0)(0,0,0)[0] intercept   : AIC=5893.479, Time=0.22 sec
 ARIMA(2,0,2)(0,0,0)[0] intercept   : AIC=5891.721, Time=1.08 sec

Best model:  ARIMA(1,0,1)(0,0,0)[0] intercept
Total fit time: 5.871 seconds
Performing stepwise search to minimize aic
 ARIMA(1,0,1)(0,0,0)[0]             : AIC=1957.349, Time=0.11 sec
 ARIMA(0,0,0)(0,0,0)[0]             : AIC=2144.880, Time=0.02 sec

/usr/local/lib/python3.10/dist-packages/statsmodels/tsa/base/
tsa_model.py:836: ValueWarning: No supported index is available.
Prediction results will be given with an integer index beginning at
`start`.
  return get_prediction_index(
/usr/local/lib/python3.10/dist-packages/statsmodels/tsa/base/tsa_model
.py:836: FutureWarning: No supported index is available. In the next
version, calling this method in a model without a supported index will
result in an exception.
  return get_prediction_index(

 ARIMA(1,0,0)(0,0,0)[0]             : AIC=1990.467, Time=0.05 sec
 ARIMA(0,0,1)(0,0,0)[0]             : AIC=2035.789, Time=0.07 sec
 ARIMA(2,0,1)(0,0,0)[0]             : AIC=1944.304, Time=1.45 sec
```

```
ARIMA(2,0,0)(0,0,0)[0]                 : AIC=1980.234, Time=0.41 sec
ARIMA(3,0,1)(0,0,0)[0]                 : AIC=1945.848, Time=0.81 sec
ARIMA(2,0,2)(0,0,0)[0]                 : AIC=1945.850, Time=1.63 sec
ARIMA(1,0,2)(0,0,0)[0]                 : AIC=1943.935, Time=0.19 sec
ARIMA(0,0,2)(0,0,0)[0]                 : AIC=2012.267, Time=0.07 sec
ARIMA(1,0,3)(0,0,0)[0]                 : AIC=1945.848, Time=0.29 sec
ARIMA(0,0,3)(0,0,0)[0]                 : AIC=2001.069, Time=0.09 sec
ARIMA(2,0,3)(0,0,0)[0]                 : AIC=1945.030, Time=0.46 sec
ARIMA(1,0,2)(0,0,0)[0] intercept   : AIC=1937.365, Time=0.38 sec
ARIMA(0,0,2)(0,0,0)[0] intercept   : AIC=1960.184, Time=0.18 sec
ARIMA(1,0,1)(0,0,0)[0] intercept   : AIC=1945.173, Time=0.26 sec
ARIMA(2,0,2)(0,0,0)[0] intercept   : AIC=1939.365, Time=0.62 sec
ARIMA(1,0,3)(0,0,0)[0] intercept   : AIC=1939.365, Time=0.49 sec
ARIMA(0,0,1)(0,0,0)[0] intercept   : AIC=1969.347, Time=0.12 sec
ARIMA(0,0,3)(0,0,0)[0] intercept   : AIC=1956.610, Time=0.22 sec
ARIMA(2,0,1)(0,0,0)[0] intercept   : AIC=1938.097, Time=0.40 sec
ARIMA(2,0,3)(0,0,0)[0] intercept   : AIC=1938.274, Time=0.96 sec

Best model:  ARIMA(1,0,2)(0,0,0)[0] intercept
Total fit time: 9.316 seconds
Performing stepwise search to minimize aic

/usr/local/lib/python3.10/dist-packages/statsmodels/tsa/base/
tsa_model.py:836: ValueWarning: No supported index is available.
Prediction results will be given with an integer index beginning at
`start`.
  return get_prediction_index(
/usr/local/lib/python3.10/dist-packages/statsmodels/tsa/base/tsa_model
.py:836: FutureWarning: No supported index is available. In the next
version, calling this method in a model without a supported index will
result in an exception.
  return get_prediction_index(

ARIMA(1,1,1)(0,0,0)[0] intercept   : AIC=5709.284, Time=0.35 sec
ARIMA(0,1,0)(0,0,0)[0] intercept   : AIC=5880.823, Time=0.04 sec
ARIMA(1,1,0)(0,0,0)[0] intercept   : AIC=5821.054, Time=0.13 sec
ARIMA(0,1,1)(0,0,0)[0] intercept   : AIC=5751.834, Time=0.20 sec
ARIMA(0,1,0)(0,0,0)[0]                 : AIC=5878.823, Time=0.03 sec
ARIMA(2,1,1)(0,0,0)[0] intercept   : AIC=5711.235, Time=0.52 sec
ARIMA(1,1,2)(0,0,0)[0] intercept   : AIC=5711.140, Time=0.56 sec
ARIMA(0,1,2)(0,0,0)[0] intercept   : AIC=5710.751, Time=0.23 sec
ARIMA(2,1,0)(0,0,0)[0] intercept   : AIC=5759.030, Time=0.26 sec
ARIMA(2,1,2)(0,0,0)[0] intercept   : AIC=5709.645, Time=0.68 sec
ARIMA(1,1,1)(0,0,0)[0]                 : AIC=5707.285, Time=0.13 sec
ARIMA(0,1,1)(0,0,0)[0]                 : AIC=5749.834, Time=0.11 sec
ARIMA(1,1,0)(0,0,0)[0]                 : AIC=5819.055, Time=0.07 sec
ARIMA(2,1,1)(0,0,0)[0]                 : AIC=5709.235, Time=0.25 sec
ARIMA(1,1,2)(0,0,0)[0]                 : AIC=5709.140, Time=0.27 sec
ARIMA(0,1,2)(0,0,0)[0]                 : AIC=5708.751, Time=0.12 sec
ARIMA(2,1,0)(0,0,0)[0]                 : AIC=5757.030, Time=0.12 sec
```

```
 ARIMA(2,1,2)(0,0,0)[0]                : AIC=5707.645, Time=0.37 sec

Best model:  ARIMA(1,1,1)(0,0,0)[0]
Total fit time: 4.473 seconds
Performing stepwise search to minimize aic

/usr/local/lib/python3.10/dist-packages/statsmodels/tsa/base/
tsa_model.py:836: ValueWarning: No supported index is available.
Prediction results will be given with an integer index beginning at
`start`.
   return get_prediction_index(
/usr/local/lib/python3.10/dist-packages/statsmodels/tsa/base/tsa_model
.py:836: FutureWarning: No supported index is available. In the next
version, calling this method in a model without a supported index will
result in an exception.
   return get_prediction_index(

 ARIMA(1,1,1)(0,0,0)[0] intercept   : AIC=1138.812, Time=0.28 sec
 ARIMA(0,1,0)(0,0,0)[0] intercept   : AIC=1318.381, Time=0.13 sec
 ARIMA(1,1,0)(0,0,0)[0] intercept   : AIC=1223.940, Time=0.05 sec
 ARIMA(0,1,1)(0,0,0)[0] intercept   : AIC=1148.436, Time=0.14 sec
 ARIMA(0,1,0)(0,0,0)[0]             : AIC=1316.381, Time=0.03 sec
 ARIMA(2,1,1)(0,0,0)[0] intercept   : AIC=1137.755, Time=2.34 sec
 ARIMA(2,1,0)(0,0,0)[0] intercept   : AIC=1204.289, Time=0.28 sec
 ARIMA(3,1,1)(0,0,0)[0] intercept   : AIC=1139.422, Time=1.95 sec
 ARIMA(2,1,2)(0,0,0)[0] intercept   : AIC=1139.646, Time=0.98 sec
 ARIMA(1,1,2)(0,0,0)[0] intercept   : AIC=1138.845, Time=0.61 sec
 ARIMA(3,1,0)(0,0,0)[0] intercept   : AIC=1195.439, Time=0.14 sec
 ARIMA(3,1,2)(0,0,0)[0] intercept   : AIC=1141.728, Time=0.71 sec
 ARIMA(2,1,1)(0,0,0)[0]             : AIC=1135.776, Time=0.16 sec
 ARIMA(1,1,1)(0,0,0)[0]             : AIC=1136.825, Time=0.11 sec
 ARIMA(2,1,0)(0,0,0)[0]             : AIC=1202.290, Time=0.05 sec
 ARIMA(3,1,1)(0,0,0)[0]             : AIC=1137.438, Time=0.25 sec
 ARIMA(2,1,2)(0,0,0)[0]             : AIC=1137.666, Time=0.31 sec
 ARIMA(1,1,0)(0,0,0)[0]             : AIC=1221.941, Time=0.04 sec
 ARIMA(1,1,2)(0,0,0)[0]             : AIC=1136.867, Time=0.24 sec
 ARIMA(3,1,0)(0,0,0)[0]             : AIC=1193.440, Time=0.09 sec
 ARIMA(3,1,2)(0,0,0)[0]             : AIC=1139.749, Time=0.29 sec

Best model:  ARIMA(2,1,1)(0,0,0)[0]
Total fit time: 9.225 seconds
Performing stepwise search to minimize aic
 ARIMA(1,0,1)(0,0,0)[0]                : AIC=4089.196, Time=0.09 sec
 ARIMA(0,0,0)(0,0,0)[0]                : AIC=4773.191, Time=0.02 sec

/usr/local/lib/python3.10/dist-packages/statsmodels/tsa/base/
tsa_model.py:836: ValueWarning: No supported index is available.
Prediction results will be given with an integer index beginning at
`start`.
   return get_prediction_index(
```

```
/usr/local/lib/python3.10/dist-packages/statsmodels/tsa/base/tsa_model
.py:836: FutureWarning: No supported index is available. In the next
version, calling this method in a model without a supported index will
result in an exception.
  return get_prediction_index(

 ARIMA(1,0,0)(0,0,0)[0]                 : AIC=4113.798, Time=0.07 sec
 ARIMA(0,0,1)(0,0,0)[0]                 : AIC=4401.958, Time=0.08 sec
 ARIMA(2,0,1)(0,0,0)[0]                 : AIC=4083.192, Time=0.30 sec
 ARIMA(2,0,0)(0,0,0)[0]                 : AIC=4097.950, Time=0.07 sec
 ARIMA(3,0,1)(0,0,0)[0]                 : AIC=4084.133, Time=0.25 sec
 ARIMA(2,0,2)(0,0,0)[0]                 : AIC=4084.618, Time=0.30 sec
 ARIMA(1,0,2)(0,0,0)[0]                 : AIC=4082.793, Time=0.14 sec
 ARIMA(0,0,2)(0,0,0)[0]                 : AIC=4255.357, Time=0.13 sec
 ARIMA(1,0,3)(0,0,0)[0]                 : AIC=4084.361, Time=0.26 sec
 ARIMA(0,0,3)(0,0,0)[0]                 : AIC=4221.237, Time=0.15 sec
 ARIMA(2,0,3)(0,0,0)[0]                 : AIC=4084.945, Time=0.38 sec
 ARIMA(1,0,2)(0,0,0)[0] intercept       : AIC=4068.210, Time=0.36 sec
 ARIMA(0,0,2)(0,0,0)[0] intercept       : AIC=4161.551, Time=0.29 sec
 ARIMA(1,0,1)(0,0,0)[0] intercept       : AIC=4071.035, Time=0.26 sec
 ARIMA(2,0,2)(0,0,0)[0] intercept       : AIC=4070.209, Time=0.58 sec
 ARIMA(1,0,3)(0,0,0)[0] intercept       : AIC=4070.207, Time=0.53 sec
 ARIMA(0,0,1)(0,0,0)[0] intercept       : AIC=4263.630, Time=0.17 sec
 ARIMA(0,0,3)(0,0,0)[0] intercept       : AIC=4142.721, Time=0.45 sec
 ARIMA(2,0,1)(0,0,0)[0] intercept       : AIC=4069.232, Time=0.45 sec
 ARIMA(2,0,3)(0,0,0)[0] intercept       : AIC=4071.177, Time=1.63 sec

Best model:  ARIMA(1,0,2)(0,0,0)[0] intercept
Total fit time: 6.988 seconds
Performing stepwise search to minimize aic

/usr/local/lib/python3.10/dist-packages/statsmodels/tsa/base/
tsa_model.py:836: ValueWarning: No supported index is available.
Prediction results will be given with an integer index beginning at
`start`.
  return get_prediction_index(
/usr/local/lib/python3.10/dist-packages/statsmodels/tsa/base/tsa_model
.py:836: FutureWarning: No supported index is available. In the next
version, calling this method in a model without a supported index will
result in an exception.
  return get_prediction_index(

 ARIMA(1,1,1)(0,0,0)[0] intercept       : AIC=1182.248, Time=0.86 sec
 ARIMA(0,1,0)(0,0,0)[0] intercept       : AIC=1339.413, Time=0.06 sec
 ARIMA(1,1,0)(0,0,0)[0] intercept       : AIC=1249.038, Time=0.08 sec
 ARIMA(0,1,1)(0,0,0)[0] intercept       : AIC=1181.696, Time=0.37 sec
 ARIMA(0,1,0)(0,0,0)[0]                 : AIC=1337.413, Time=0.07 sec
 ARIMA(0,1,2)(0,0,0)[0] intercept       : AIC=1182.370, Time=1.45 sec
 ARIMA(1,1,2)(0,0,0)[0] intercept       : AIC=1183.506, Time=0.58 sec
 ARIMA(0,1,1)(0,0,0)[0]                 : AIC=1179.699, Time=0.06 sec
```

```
 ARIMA(1,1,1)(0,0,0)[0]                : AIC=1180.252, Time=0.08 sec
 ARIMA(0,1,2)(0,0,0)[0]                : AIC=1180.374, Time=0.08 sec
 ARIMA(1,1,0)(0,0,0)[0]                : AIC=1247.038, Time=0.04 sec
 ARIMA(1,1,2)(0,0,0)[0]                : AIC=1181.509, Time=0.18 sec

Best model:  ARIMA(0,1,1)(0,0,0)[0]
Total fit time: 3.933 seconds
Performing stepwise search to minimize aic
 ARIMA(1,0,1)(0,0,0)[0]                : AIC=4715.614, Time=0.09 sec
 ARIMA(0,0,0)(0,0,0)[0]                : AIC=5005.829, Time=0.02 sec

/usr/local/lib/python3.10/dist-packages/statsmodels/tsa/base/
tsa_model.py:836: ValueWarning: No supported index is available.
Prediction results will be given with an integer index beginning at
`start`.
  return get_prediction_index(
/usr/local/lib/python3.10/dist-packages/statsmodels/tsa/base/tsa_model
.py:836: FutureWarning: No supported index is available. In the next
version, calling this method in a model without a supported index will
result in an exception.
  return get_prediction_index(

 ARIMA(1,0,0)(0,0,0)[0]                : AIC=4719.442, Time=0.07 sec
 ARIMA(0,0,1)(0,0,0)[0]                : AIC=4748.007, Time=0.07 sec
 ARIMA(2,0,1)(0,0,0)[0]                : AIC=4706.029, Time=0.24 sec
 ARIMA(2,0,0)(0,0,0)[0]                : AIC=4719.311, Time=0.07 sec
 ARIMA(3,0,1)(0,0,0)[0]                : AIC=4681.703, Time=0.34 sec
 ARIMA(3,0,0)(0,0,0)[0]                : AIC=4691.917, Time=0.11 sec
 ARIMA(3,0,2)(0,0,0)[0]                : AIC=4678.147, Time=0.43 sec
 ARIMA(2,0,2)(0,0,0)[0]                : AIC=4677.330, Time=0.60 sec
 ARIMA(1,0,2)(0,0,0)[0]                : AIC=4674.418, Time=0.19 sec
 ARIMA(0,0,2)(0,0,0)[0]                : AIC=4731.598, Time=0.11 sec
 ARIMA(1,0,3)(0,0,0)[0]                : AIC=4676.319, Time=0.29 sec
 ARIMA(0,0,3)(0,0,0)[0]                : AIC=4717.604, Time=0.15 sec
 ARIMA(2,0,3)(0,0,0)[0]                : AIC=4678.325, Time=0.25 sec
 ARIMA(1,0,2)(0,0,0)[0] intercept    : AIC=4664.610, Time=0.48 sec
 ARIMA(0,0,2)(0,0,0)[0] intercept    : AIC=4683.252, Time=0.33 sec
 ARIMA(1,0,1)(0,0,0)[0] intercept    : AIC=4679.201, Time=0.28 sec
 ARIMA(2,0,2)(0,0,0)[0] intercept    : AIC=4666.130, Time=0.68 sec
 ARIMA(1,0,3)(0,0,0)[0] intercept    : AIC=4666.124, Time=0.58 sec
 ARIMA(0,0,1)(0,0,0)[0] intercept    : AIC=4688.574, Time=0.15 sec
 ARIMA(0,0,3)(0,0,0)[0] intercept    : AIC=4677.648, Time=0.51 sec
 ARIMA(2,0,1)(0,0,0)[0] intercept    : AIC=4674.478, Time=0.54 sec
 ARIMA(2,0,3)(0,0,0)[0] intercept    : AIC=4667.959, Time=1.00 sec

Best model:  ARIMA(1,0,2)(0,0,0)[0] intercept
Total fit time: 7.621 seconds
Performing stepwise search to minimize aic
```

```
/usr/local/lib/python3.10/dist-packages/statsmodels/tsa/base/
tsa_model.py:836: ValueWarning: No supported index is available.
Prediction results will be given with an integer index beginning at
`start`.
  return get_prediction_index(
/usr/local/lib/python3.10/dist-packages/statsmodels/tsa/base/tsa_model
.py:836: FutureWarning: No supported index is available. In the next
version, calling this method in a model without a supported index will
result in an exception.
  return get_prediction_index(

 ARIMA(1,0,1)(0,0,0)[0]             : AIC=434.394, Time=0.21 sec
 ARIMA(0,0,0)(0,0,0)[0]             : AIC=463.423, Time=0.04 sec
 ARIMA(1,0,0)(0,0,0)[0]             : AIC=460.887, Time=0.03 sec
 ARIMA(0,0,1)(0,0,0)[0]             : AIC=461.705, Time=0.03 sec
 ARIMA(2,0,1)(0,0,0)[0]             : AIC=436.066, Time=0.22 sec
 ARIMA(1,0,2)(0,0,0)[0]             : AIC=436.035, Time=0.18 sec
 ARIMA(0,0,2)(0,0,0)[0]             : AIC=461.152, Time=0.07 sec
 ARIMA(2,0,0)(0,0,0)[0]             : AIC=459.298, Time=0.04 sec
 ARIMA(2,0,2)(0,0,0)[0]             : AIC=inf, Time=0.78 sec
 ARIMA(1,0,1)(0,0,0)[0] intercept   : AIC=433.237, Time=0.17 sec
 ARIMA(0,0,1)(0,0,0)[0] intercept   : AIC=431.238, Time=0.23 sec
 ARIMA(0,0,0)(0,0,0)[0] intercept   : AIC=429.246, Time=0.15 sec
 ARIMA(1,0,0)(0,0,0)[0] intercept   : AIC=431.238, Time=0.08 sec

Best model:  ARIMA(0,0,0)(0,0,0)[0] intercept
Total fit time: 2.262 seconds
Performing stepwise search to minimize aic

/usr/local/lib/python3.10/dist-packages/statsmodels/tsa/base/
tsa_model.py:836: ValueWarning: No supported index is available.
Prediction results will be given with an integer index beginning at
`start`.
  return get_prediction_index(
/usr/local/lib/python3.10/dist-packages/statsmodels/tsa/base/tsa_model
.py:836: FutureWarning: No supported index is available. In the next
version, calling this method in a model without a supported index will
result in an exception.
  return get_prediction_index(

 ARIMA(1,0,1)(0,0,0)[0]             : AIC=5112.938, Time=0.59 sec
 ARIMA(0,0,0)(0,0,0)[0]             : AIC=5475.562, Time=0.04 sec
 ARIMA(1,0,0)(0,0,0)[0]             : AIC=5143.462, Time=0.08 sec
 ARIMA(0,0,1)(0,0,0)[0]             : AIC=5286.018, Time=0.51 sec
 ARIMA(2,0,1)(0,0,0)[0]             : AIC=5104.408, Time=0.83 sec
 ARIMA(2,0,0)(0,0,0)[0]             : AIC=5115.787, Time=1.12 sec
 ARIMA(3,0,1)(0,0,0)[0]             : AIC=5118.369, Time=0.59 sec
 ARIMA(2,0,2)(0,0,0)[0]             : AIC=5114.733, Time=0.25 sec
 ARIMA(1,0,2)(0,0,0)[0]             : AIC=5113.172, Time=0.23 sec
 ARIMA(3,0,0)(0,0,0)[0]             : AIC=5117.621, Time=0.14 sec
```

```
 ARIMA(3,0,2)(0,0,0)[0]                   : AIC=5094.482, Time=0.55 sec
 ARIMA(3,0,3)(0,0,0)[0]                   : AIC=5096.374, Time=0.87 sec
 ARIMA(2,0,3)(0,0,0)[0]                   : AIC=5098.579, Time=0.84 sec
 ARIMA(3,0,2)(0,0,0)[0] intercept   : AIC=5089.624, Time=1.31 sec
 ARIMA(2,0,2)(0,0,0)[0] intercept   : AIC=5092.323, Time=0.81 sec
 ARIMA(3,0,1)(0,0,0)[0] intercept   : AIC=5092.757, Time=0.99 sec
 ARIMA(3,0,3)(0,0,0)[0] intercept   : AIC=5091.316, Time=1.71 sec
 ARIMA(2,0,1)(0,0,0)[0] intercept   : AIC=5091.412, Time=0.56 sec
 ARIMA(2,0,3)(0,0,0)[0] intercept   : AIC=5090.112, Time=1.06 sec

Best model:  ARIMA(3,0,2)(0,0,0)[0] intercept
Total fit time: 13.135 seconds
Performing stepwise search to minimize aic
 ARIMA(1,0,1)(0,0,0)[0]                   : AIC=4949.654, Time=0.11 sec
 ARIMA(0,0,0)(0,0,0)[0]                   : AIC=5403.600, Time=0.02 sec

/usr/local/lib/python3.10/dist-packages/statsmodels/tsa/base/
tsa_model.py:836: ValueWarning: No supported index is available.
Prediction results will be given with an integer index beginning at
`start`.
  return get_prediction_index(
/usr/local/lib/python3.10/dist-packages/statsmodels/tsa/base/tsa_model
.py:836: FutureWarning: No supported index is available. In the next
version, calling this method in a model without a supported index will
result in an exception.
  return get_prediction_index(

 ARIMA(1,0,0)(0,0,0)[0]                   : AIC=5043.962, Time=0.06 sec
 ARIMA(0,0,1)(0,0,0)[0]                   : AIC=5196.626, Time=0.09 sec
 ARIMA(2,0,1)(0,0,0)[0]                   : AIC=4950.224, Time=0.19 sec
 ARIMA(1,0,2)(0,0,0)[0]                   : AIC=4950.227, Time=0.35 sec
 ARIMA(0,0,2)(0,0,0)[0]                   : AIC=5115.038, Time=0.56 sec
 ARIMA(2,0,0)(0,0,0)[0]                   : AIC=4986.237, Time=0.77 sec
 ARIMA(2,0,2)(0,0,0)[0]                   : AIC=4952.222, Time=2.06 sec
 ARIMA(1,0,1)(0,0,0)[0] intercept   : AIC=4941.965, Time=0.60 sec
 ARIMA(0,0,1)(0,0,0)[0] intercept   : AIC=5105.094, Time=0.30 sec
 ARIMA(1,0,0)(0,0,0)[0] intercept   : AIC=5008.992, Time=0.15 sec
 ARIMA(2,0,1)(0,0,0)[0] intercept   : AIC=4943.237, Time=0.47 sec
 ARIMA(1,0,2)(0,0,0)[0] intercept   : AIC=4943.215, Time=0.42 sec
 ARIMA(0,0,0)(0,0,0)[0] intercept   : AIC=5261.057, Time=0.05 sec
 ARIMA(0,0,2)(0,0,0)[0] intercept   : AIC=5047.079, Time=0.38 sec
 ARIMA(2,0,0)(0,0,0)[0] intercept   : AIC=4966.808, Time=0.28 sec
 ARIMA(2,0,2)(0,0,0)[0] intercept   : AIC=4945.201, Time=0.93 sec

Best model:  ARIMA(1,0,1)(0,0,0)[0] intercept
Total fit time: 7.836 seconds
Performing stepwise search to minimize aic

/usr/local/lib/python3.10/dist-packages/statsmodels/tsa/base/
tsa_model.py:836: ValueWarning: No supported index is available.
```

```
Prediction results will be given with an integer index beginning at
`start`.
  return get_prediction_index(
/usr/local/lib/python3.10/dist-packages/statsmodels/tsa/base/tsa_model
.py:836: FutureWarning: No supported index is available. In the next
version, calling this method in a model without a supported index will
result in an exception.
  return get_prediction_index(

 ARIMA(1,1,1)(0,0,0)[0] intercept   : AIC=1953.502, Time=0.28 sec
 ARIMA(0,1,0)(0,0,0)[0] intercept   : AIC=2258.151, Time=0.03 sec
 ARIMA(1,1,0)(0,0,0)[0] intercept   : AIC=2072.319, Time=0.09 sec
 ARIMA(0,1,1)(0,0,0)[0] intercept   : AIC=1951.513, Time=0.23 sec
 ARIMA(0,1,0)(0,0,0)[0]             : AIC=2256.151, Time=0.03 sec
 ARIMA(0,1,2)(0,0,0)[0] intercept   : AIC=1953.504, Time=0.29 sec
 ARIMA(1,1,2)(0,0,0)[0] intercept   : AIC=1954.279, Time=0.67 sec
 ARIMA(0,1,1)(0,0,0)[0]             : AIC=1949.514, Time=0.08 sec
 ARIMA(1,1,1)(0,0,0)[0]             : AIC=1951.503, Time=0.10 sec
 ARIMA(0,1,2)(0,0,0)[0]             : AIC=1951.506, Time=0.14 sec
 ARIMA(1,1,0)(0,0,0)[0]             : AIC=2070.319, Time=0.05 sec
 ARIMA(1,1,2)(0,0,0)[0]             : AIC=1952.279, Time=0.27 sec

Best model:  ARIMA(0,1,1)(0,0,0)[0]
Total fit time: 2.282 seconds
Performing stepwise search to minimize aic

/usr/local/lib/python3.10/dist-packages/statsmodels/tsa/base/
tsa_model.py:836: ValueWarning: No supported index is available.
Prediction results will be given with an integer index beginning at
`start`.
  return get_prediction_index(
/usr/local/lib/python3.10/dist-packages/statsmodels/tsa/base/tsa_model
.py:836: FutureWarning: No supported index is available. In the next
version, calling this method in a model without a supported index will
result in an exception.
  return get_prediction_index(

 ARIMA(1,1,1)(0,0,0)[0] intercept   : AIC=3068.006, Time=0.25 sec
 ARIMA(0,1,0)(0,0,0)[0] intercept   : AIC=3341.022, Time=0.04 sec
 ARIMA(1,1,0)(0,0,0)[0] intercept   : AIC=3194.930, Time=0.08 sec
 ARIMA(0,1,1)(0,0,0)[0] intercept   : AIC=3066.360, Time=0.15 sec
 ARIMA(0,1,0)(0,0,0)[0]             : AIC=3339.022, Time=0.04 sec
 ARIMA(0,1,2)(0,0,0)[0] intercept   : AIC=3067.967, Time=0.25 sec
 ARIMA(1,1,2)(0,0,0)[0] intercept   : AIC=3068.848, Time=0.39 sec
 ARIMA(0,1,1)(0,0,0)[0]             : AIC=3064.365, Time=0.06 sec
 ARIMA(1,1,1)(0,0,0)[0]             : AIC=3066.010, Time=0.11 sec
 ARIMA(0,1,2)(0,0,0)[0]             : AIC=3065.971, Time=0.09 sec
 ARIMA(1,1,0)(0,0,0)[0]             : AIC=3192.931, Time=0.05 sec
 ARIMA(1,1,2)(0,0,0)[0]             : AIC=3066.853, Time=0.21 sec
```

```
Best model:  ARIMA(0,1,1)(0,0,0)[0]
Total fit time: 1.746 seconds
Performing stepwise search to minimize aic
 ARIMA(1,0,1)(0,0,0)[0]                 : AIC=483.052, Time=0.13 sec

/usr/local/lib/python3.10/dist-packages/statsmodels/tsa/base/
tsa_model.py:836: ValueWarning: No supported index is available.
Prediction results will be given with an integer index beginning at
`start`.
  return get_prediction_index(
/usr/local/lib/python3.10/dist-packages/statsmodels/tsa/base/tsa_model
.py:836: FutureWarning: No supported index is available. In the next
version, calling this method in a model without a supported index will
result in an exception.
  return get_prediction_index(

 ARIMA(0,0,0)(0,0,0)[0]                 : AIC=513.654, Time=0.06 sec
 ARIMA(1,0,0)(0,0,0)[0]                 : AIC=499.897, Time=0.06 sec
 ARIMA(0,0,1)(0,0,0)[0]                 : AIC=504.896, Time=0.07 sec
 ARIMA(2,0,1)(0,0,0)[0]                 : AIC=482.276, Time=0.24 sec
 ARIMA(2,0,0)(0,0,0)[0]                 : AIC=481.094, Time=0.07 sec
 ARIMA(3,0,0)(0,0,0)[0]                 : AIC=482.205, Time=0.09 sec
 ARIMA(3,0,1)(0,0,0)[0]                 : AIC=483.952, Time=0.26 sec
 ARIMA(2,0,0)(0,0,0)[0] intercept   : AIC=470.536, Time=0.12 sec
 ARIMA(1,0,0)(0,0,0)[0] intercept   : AIC=482.861, Time=0.10 sec
 ARIMA(3,0,0)(0,0,0)[0] intercept   : AIC=472.421, Time=0.15 sec
 ARIMA(2,0,1)(0,0,0)[0] intercept   : AIC=472.459, Time=0.29 sec
 ARIMA(1,0,1)(0,0,0)[0] intercept   : AIC=476.021, Time=0.24 sec
 ARIMA(3,0,1)(0,0,0)[0] intercept   : AIC=473.246, Time=0.84 sec

Best model:  ARIMA(2,0,0)(0,0,0)[0] intercept
Total fit time: 2.725 seconds
Warning: Invalid prediction range for item B09X1GMWY6. Skipping
forecast.
Performing stepwise search to minimize aic
 ARIMA(1,1,1)(0,0,0)[0] intercept   : AIC=3739.729, Time=0.27 sec
 ARIMA(0,1,0)(0,0,0)[0] intercept   : AIC=4024.630, Time=0.06 sec
 ARIMA(1,1,0)(0,0,0)[0] intercept   : AIC=3846.525, Time=0.14 sec
 ARIMA(0,1,1)(0,0,0)[0] intercept   : AIC=3738.027, Time=0.25 sec
 ARIMA(0,1,0)(0,0,0)[0]                 : AIC=4022.630, Time=0.07 sec
 ARIMA(0,1,2)(0,0,0)[0] intercept   : AIC=3739.743, Time=0.78 sec
 ARIMA(1,1,2)(0,0,0)[0] intercept   : AIC=3740.770, Time=1.35 sec
 ARIMA(0,1,1)(0,0,0)[0]                 : AIC=3736.028, Time=0.10 sec
 ARIMA(1,1,1)(0,0,0)[0]                 : AIC=3737.730, Time=0.32 sec
 ARIMA(0,1,2)(0,0,0)[0]                 : AIC=3737.743, Time=0.93 sec
 ARIMA(1,1,0)(0,0,0)[0]                 : AIC=3844.525, Time=0.11 sec
 ARIMA(1,1,2)(0,0,0)[0]                 : AIC=3738.771, Time=0.53 sec

Best model:  ARIMA(0,1,1)(0,0,0)[0]
Total fit time: 4.950 seconds
```

```
Performing stepwise search to minimize aic
 ARIMA(1,0,1)(0,0,0)[0]                     : AIC=2136.405, Time=0.07 sec
 ARIMA(0,0,0)(0,0,0)[0]                     : AIC=2529.689, Time=0.02 sec
 ARIMA(1,0,0)(0,0,0)[0]                     : AIC=2158.010, Time=0.04 sec

/usr/local/lib/python3.10/dist-packages/statsmodels/tsa/base/
tsa_model.py:836: ValueWarning: No supported index is available.
Prediction results will be given with an integer index beginning at
`start`.
  return get_prediction_index(
/usr/local/lib/python3.10/dist-packages/statsmodels/tsa/base/tsa_model
.py:836: FutureWarning: No supported index is available. In the next
version, calling this method in a model without a supported index will
result in an exception.
  return get_prediction_index(

 ARIMA(0,0,1)(0,0,0)[0]                     : AIC=2318.868, Time=0.06 sec
 ARIMA(2,0,1)(0,0,0)[0]                     : AIC=2138.066, Time=0.14 sec
 ARIMA(1,0,2)(0,0,0)[0]                     : AIC=2137.992, Time=0.12 sec
 ARIMA(0,0,2)(0,0,0)[0]                     : AIC=2243.419, Time=0.08 sec
 ARIMA(2,0,0)(0,0,0)[0]                     : AIC=2140.724, Time=0.08 sec
 ARIMA(2,0,2)(0,0,0)[0]                     : AIC=2139.869, Time=0.35 sec
 ARIMA(1,0,1)(0,0,0)[0] intercept   : AIC=2130.970, Time=0.15 sec
 ARIMA(0,0,1)(0,0,0)[0] intercept   : AIC=2271.077, Time=0.12 sec
 ARIMA(1,0,0)(0,0,0)[0] intercept   : AIC=2146.999, Time=0.09 sec
 ARIMA(2,0,1)(0,0,0)[0] intercept   : AIC=2132.880, Time=0.29 sec
 ARIMA(1,0,2)(0,0,0)[0] intercept   : AIC=2132.846, Time=0.25 sec
 ARIMA(0,0,0)(0,0,0)[0] intercept   : AIC=2455.462, Time=0.03 sec
 ARIMA(0,0,2)(0,0,0)[0] intercept   : AIC=2209.863, Time=0.21 sec
 ARIMA(2,0,0)(0,0,0)[0] intercept   : AIC=2133.744, Time=0.12 sec
 ARIMA(2,0,2)(0,0,0)[0] intercept   : AIC=2134.697, Time=0.47 sec

Best model:  ARIMA(1,0,1)(0,0,0)[0] intercept
Total fit time: 2.713 seconds
Warning: Invalid prediction range for item B0B31S8KPF. Skipping
forecast.
Performing stepwise search to minimize aic
 ARIMA(1,0,1)(0,0,0)[0]                     : AIC=5184.032, Time=0.12 sec
 ARIMA(0,0,0)(0,0,0)[0]                     : AIC=5691.525, Time=0.02 sec
 ARIMA(1,0,0)(0,0,0)[0]                     : AIC=5217.504, Time=0.06 sec
 ARIMA(0,0,1)(0,0,0)[0]                     : AIC=5249.875, Time=0.07 sec
 ARIMA(2,0,1)(0,0,0)[0]                     : AIC=5154.196, Time=0.21 sec
 ARIMA(2,0,0)(0,0,0)[0]                     : AIC=5212.196, Time=0.09 sec
 ARIMA(3,0,1)(0,0,0)[0]                     : AIC=5137.114, Time=0.25 sec
 ARIMA(3,0,0)(0,0,0)[0]                     : AIC=5149.351, Time=0.14 sec
 ARIMA(3,0,2)(0,0,0)[0]                     : AIC=5124.494, Time=0.72 sec
 ARIMA(2,0,2)(0,0,0)[0]                     : AIC=5127.523, Time=0.27 sec
 ARIMA(3,0,3)(0,0,0)[0]                     : AIC=5118.502, Time=1.10 sec
 ARIMA(2,0,3)(0,0,0)[0]                     : AIC=5129.461, Time=0.44 sec
 ARIMA(3,0,3)(0,0,0)[0] intercept   : AIC=5116.457, Time=0.92 sec
```

```
 ARIMA(2,0,3)(0,0,0)[0] intercept    : AIC=5114.463, Time=1.20 sec
 ARIMA(1,0,3)(0,0,0)[0] intercept    : AIC=5112.567, Time=0.64 sec
 ARIMA(0,0,3)(0,0,0)[0] intercept    : AIC=5134.138, Time=0.45 sec
 ARIMA(1,0,2)(0,0,0)[0] intercept    : AIC=5112.984, Time=0.55 sec
 ARIMA(0,0,2)(0,0,0)[0] intercept    : AIC=5149.267, Time=1.18 sec
 ARIMA(2,0,2)(0,0,0)[0] intercept    : AIC=5112.766, Time=3.13 sec
 ARIMA(1,0,3)(0,0,0)[0]              : AIC=5127.592, Time=0.29 sec

Best model:  ARIMA(1,0,3)(0,0,0)[0] intercept
Total fit time: 11.893 seconds
Performing stepwise search to minimize aic

/usr/local/lib/python3.10/dist-packages/statsmodels/tsa/base/
tsa_model.py:836: ValueWarning: No supported index is available.
Prediction results will be given with an integer index beginning at
`start`.
  return get_prediction_index(
/usr/local/lib/python3.10/dist-packages/statsmodels/tsa/base/tsa_model
.py:836: FutureWarning: No supported index is available. In the next
version, calling this method in a model without a supported index will
result in an exception.
  return get_prediction_index(

 ARIMA(1,1,1)(0,0,0)[0] intercept    : AIC=2422.395, Time=0.28 sec
 ARIMA(0,1,0)(0,0,0)[0] intercept    : AIC=2751.371, Time=0.04 sec
 ARIMA(1,1,0)(0,0,0)[0] intercept    : AIC=2583.006, Time=0.08 sec
 ARIMA(0,1,1)(0,0,0)[0] intercept    : AIC=2420.649, Time=0.22 sec
 ARIMA(0,1,0)(0,0,0)[0]              : AIC=2749.371, Time=0.04 sec
 ARIMA(0,1,2)(0,0,0)[0] intercept    : AIC=2422.411, Time=0.25 sec
 ARIMA(1,1,2)(0,0,0)[0] intercept    : AIC=2423.913, Time=0.67 sec
 ARIMA(0,1,1)(0,0,0)[0]              : AIC=2418.652, Time=0.09 sec
 ARIMA(1,1,1)(0,0,0)[0]              : AIC=2420.398, Time=0.11 sec
 ARIMA(0,1,2)(0,0,0)[0]              : AIC=2420.413, Time=0.11 sec
 ARIMA(1,1,0)(0,0,0)[0]              : AIC=2581.006, Time=0.04 sec
 ARIMA(1,1,2)(0,0,0)[0]              : AIC=2421.915, Time=0.28 sec

Best model:  ARIMA(0,1,1)(0,0,0)[0]
Total fit time: 2.247 seconds
Performing stepwise search to minimize aic

/usr/local/lib/python3.10/dist-packages/statsmodels/tsa/base/
tsa_model.py:836: ValueWarning: No supported index is available.
Prediction results will be given with an integer index beginning at
`start`.
  return get_prediction_index(
/usr/local/lib/python3.10/dist-packages/statsmodels/tsa/base/tsa_model
.py:836: FutureWarning: No supported index is available. In the next
version, calling this method in a model without a supported index will
result in an exception.
  return get_prediction_index(
```

```
ARIMA(1,1,1)(0,0,0)[0] intercept   : AIC=5406.682, Time=0.34 sec
ARIMA(0,1,0)(0,0,0)[0] intercept   : AIC=5545.990, Time=0.05 sec
ARIMA(1,1,0)(0,0,0)[0] intercept   : AIC=5461.972, Time=0.12 sec
ARIMA(0,1,1)(0,0,0)[0] intercept   : AIC=5411.725, Time=0.23 sec
ARIMA(0,1,0)(0,0,0)[0]             : AIC=5543.992, Time=0.03 sec
ARIMA(2,1,1)(0,0,0)[0] intercept   : AIC=5361.261, Time=0.38 sec
ARIMA(2,1,0)(0,0,0)[0] intercept   : AIC=5381.697, Time=0.21 sec
ARIMA(3,1,1)(0,0,0)[0] intercept   : AIC=5360.414, Time=0.86 sec
ARIMA(3,1,0)(0,0,0)[0] intercept   : AIC=5368.824, Time=0.32 sec
ARIMA(3,1,2)(0,0,0)[0] intercept   : AIC=inf, Time=1.69 sec
ARIMA(2,1,2)(0,0,0)[0] intercept   : AIC=5360.715, Time=0.61 sec
ARIMA(3,1,1)(0,0,0)[0]             : AIC=5358.420, Time=0.31 sec
ARIMA(2,1,1)(0,0,0)[0]             : AIC=5359.266, Time=0.16 sec
ARIMA(3,1,0)(0,0,0)[0]             : AIC=5366.829, Time=0.14 sec
ARIMA(3,1,2)(0,0,0)[0]             : AIC=5324.603, Time=0.59 sec
ARIMA(2,1,2)(0,0,0)[0]             : AIC=5358.721, Time=0.30 sec
ARIMA(3,1,3)(0,0,0)[0]             : AIC=5326.601, Time=0.92 sec
ARIMA(2,1,3)(0,0,0)[0]             : AIC=5360.652, Time=0.80 sec

Best model:  ARIMA(3,1,2)(0,0,0)[0]
Total fit time: 8.113 seconds
Performing stepwise search to minimize aic

/usr/local/lib/python3.10/dist-packages/statsmodels/tsa/base/
tsa_model.py:836: ValueWarning: No supported index is available.
Prediction results will be given with an integer index beginning at
`start`.
  return get_prediction_index(
/usr/local/lib/python3.10/dist-packages/statsmodels/tsa/base/tsa_model
.py:836: FutureWarning: No supported index is available. In the next
version, calling this method in a model without a supported index will
result in an exception.
  return get_prediction_index(

ARIMA(1,1,1)(0,0,0)[0] intercept   : AIC=5134.907, Time=1.34 sec
ARIMA(0,1,0)(0,0,0)[0] intercept   : AIC=5271.445, Time=0.07 sec
ARIMA(1,1,0)(0,0,0)[0] intercept   : AIC=5204.622, Time=0.16 sec
ARIMA(0,1,1)(0,0,0)[0] intercept   : AIC=5157.762, Time=0.39 sec
ARIMA(0,1,0)(0,0,0)[0]             : AIC=5269.445, Time=0.05 sec
ARIMA(2,1,1)(0,0,0)[0] intercept   : AIC=5138.386, Time=1.58 sec
ARIMA(1,1,2)(0,0,0)[0] intercept   : AIC=5125.841, Time=0.47 sec
ARIMA(0,1,2)(0,0,0)[0] intercept   : AIC=5137.314, Time=0.23 sec
ARIMA(2,1,2)(0,0,0)[0] intercept   : AIC=5124.438, Time=0.58 sec
ARIMA(3,1,2)(0,0,0)[0] intercept   : AIC=inf, Time=1.72 sec
ARIMA(2,1,3)(0,0,0)[0] intercept   : AIC=inf, Time=1.88 sec
ARIMA(1,1,3)(0,0,0)[0] intercept   : AIC=5127.325, Time=0.55 sec
ARIMA(3,1,1)(0,0,0)[0] intercept   : AIC=5137.335, Time=0.66 sec
ARIMA(3,1,3)(0,0,0)[0] intercept   : AIC=inf, Time=2.05 sec
ARIMA(2,1,2)(0,0,0)[0]             : AIC=5122.439, Time=0.32 sec
ARIMA(1,1,2)(0,0,0)[0]             : AIC=5123.842, Time=0.21 sec
```

```
 ARIMA(2,1,1)(0,0,0)[0]                 : AIC=5136.386, Time=0.19 sec
 ARIMA(3,1,2)(0,0,0)[0]                 : AIC=inf, Time=0.71 sec
 ARIMA(2,1,3)(0,0,0)[0]                 : AIC=inf, Time=1.03 sec
 ARIMA(1,1,1)(0,0,0)[0]                 : AIC=5132.909, Time=0.75 sec
 ARIMA(1,1,3)(0,0,0)[0]                 : AIC=5125.326, Time=1.19 sec
 ARIMA(3,1,1)(0,0,0)[0]                 : AIC=5135.335, Time=1.72 sec
 ARIMA(3,1,3)(0,0,0)[0]                 : AIC=inf, Time=1.44 sec

Best model:  ARIMA(2,1,2)(0,0,0)[0]
Total fit time: 19.336 seconds
Performing stepwise search to minimize aic

/usr/local/lib/python3.10/dist-packages/statsmodels/tsa/base/
tsa_model.py:836: ValueWarning: No supported index is available.
Prediction results will be given with an integer index beginning at
`start`.
  return get_prediction_index(
/usr/local/lib/python3.10/dist-packages/statsmodels/tsa/base/tsa_model
.py:836: FutureWarning: No supported index is available. In the next
version, calling this method in a model without a supported index will
result in an exception.
  return get_prediction_index(

 ARIMA(1,1,1)(0,0,0)[0] intercept   : AIC=6230.120, Time=0.30 sec
 ARIMA(0,1,0)(0,0,0)[0] intercept   : AIC=6341.270, Time=0.04 sec
 ARIMA(1,1,0)(0,0,0)[0] intercept   : AIC=6264.760, Time=0.13 sec
 ARIMA(0,1,1)(0,0,0)[0] intercept   : AIC=6228.437, Time=0.21 sec
 ARIMA(0,1,0)(0,0,0)[0]             : AIC=6339.271, Time=0.03 sec
 ARIMA(0,1,2)(0,0,0)[0] intercept   : AIC=6229.734, Time=0.31 sec
 ARIMA(1,1,2)(0,0,0)[0] intercept   : AIC=6203.175, Time=0.43 sec
 ARIMA(2,1,2)(0,0,0)[0] intercept   : AIC=6193.131, Time=0.52 sec
 ARIMA(2,1,1)(0,0,0)[0] intercept   : AIC=6192.434, Time=0.50 sec
 ARIMA(2,1,0)(0,0,0)[0] intercept   : AIC=6202.567, Time=0.25 sec
 ARIMA(3,1,1)(0,0,0)[0] intercept   : AIC=6192.230, Time=0.81 sec
 ARIMA(3,1,0)(0,0,0)[0] intercept   : AIC=6195.333, Time=0.35 sec
 ARIMA(3,1,2)(0,0,0)[0] intercept   : AIC=inf, Time=1.79 sec
 ARIMA(3,1,1)(0,0,0)[0]             : AIC=6190.231, Time=0.39 sec
 ARIMA(2,1,1)(0,0,0)[0]             : AIC=6190.435, Time=0.24 sec
 ARIMA(3,1,0)(0,0,0)[0]             : AIC=6193.334, Time=0.16 sec
 ARIMA(3,1,2)(0,0,0)[0]             : AIC=inf, Time=1.20 sec
 ARIMA(2,1,0)(0,0,0)[0]             : AIC=6200.568, Time=0.11 sec
 ARIMA(2,1,2)(0,0,0)[0]             : AIC=6191.132, Time=0.27 sec

Best model:  ARIMA(3,1,1)(0,0,0)[0]
Total fit time: 8.066 seconds
Performing stepwise search to minimize aic
 ARIMA(1,0,1)(0,0,0)[0]                 : AIC=4420.245, Time=0.09 sec
 ARIMA(0,0,0)(0,0,0)[0]                 : AIC=5386.442, Time=0.02 sec
```

```
/usr/local/lib/python3.10/dist-packages/statsmodels/tsa/base/
tsa_model.py:836: ValueWarning: No supported index is available.
Prediction results will be given with an integer index beginning at
`start`.
  return get_prediction_index(
/usr/local/lib/python3.10/dist-packages/statsmodels/tsa/base/tsa_model
.py:836: FutureWarning: No supported index is available. In the next
version, calling this method in a model without a supported index will
result in an exception.
  return get_prediction_index(

 ARIMA(1,0,0)(0,0,0)[0]             : AIC=4418.276, Time=0.05 sec
 ARIMA(0,0,1)(0,0,0)[0]             : AIC=4852.149, Time=0.11 sec
 ARIMA(2,0,0)(0,0,0)[0]             : AIC=4420.253, Time=0.07 sec
 ARIMA(2,0,1)(0,0,0)[0]             : AIC=4416.342, Time=0.19 sec
 ARIMA(3,0,1)(0,0,0)[0]             : AIC=4414.198, Time=0.55 sec
 ARIMA(3,0,0)(0,0,0)[0]             : AIC=4414.651, Time=0.84 sec
 ARIMA(3,0,2)(0,0,0)[0]             : AIC=inf, Time=3.70 sec
 ARIMA(2,0,2)(0,0,0)[0]             : AIC=4413.504, Time=0.36 sec
 ARIMA(1,0,2)(0,0,0)[0]             : AIC=4411.840, Time=0.15 sec
 ARIMA(0,0,2)(0,0,0)[0]             : AIC=4679.046, Time=0.14 sec
 ARIMA(1,0,3)(0,0,0)[0]             : AIC=4413.439, Time=0.23 sec
 ARIMA(0,0,3)(0,0,0)[0]             : AIC=4568.413, Time=0.18 sec
 ARIMA(2,0,3)(0,0,0)[0]             : AIC=inf, Time=1.02 sec
 ARIMA(1,0,2)(0,0,0)[0] intercept   : AIC=4390.528, Time=0.39 sec
 ARIMA(0,0,2)(0,0,0)[0] intercept   : AIC=4517.246, Time=0.36 sec
 ARIMA(1,0,1)(0,0,0)[0] intercept   : AIC=4392.085, Time=0.20 sec
 ARIMA(2,0,2)(0,0,0)[0] intercept   : AIC=4388.706, Time=0.52 sec
 ARIMA(2,0,1)(0,0,0)[0] intercept   : AIC=4387.446, Time=0.58 sec
 ARIMA(2,0,0)(0,0,0)[0] intercept   : AIC=4392.285, Time=0.23 sec
 ARIMA(3,0,1)(0,0,0)[0] intercept   : AIC=4388.697, Time=0.78 sec
 ARIMA(1,0,0)(0,0,0)[0] intercept   : AIC=4391.272, Time=0.12 sec
 ARIMA(3,0,0)(0,0,0)[0] intercept   : AIC=4391.448, Time=0.39 sec
 ARIMA(3,0,2)(0,0,0)[0] intercept   : AIC=inf, Time=1.74 sec

Best model:  ARIMA(2,0,1)(0,0,0)[0] intercept
Total fit time: 13.029 seconds
Performing stepwise search to minimize aic

/usr/local/lib/python3.10/dist-packages/statsmodels/tsa/base/
tsa_model.py:836: ValueWarning: No supported index is available.
Prediction results will be given with an integer index beginning at
`start`.
  return get_prediction_index(
/usr/local/lib/python3.10/dist-packages/statsmodels/tsa/base/tsa_model
.py:836: FutureWarning: No supported index is available. In the next
version, calling this method in a model without a supported index will
result in an exception.
  return get_prediction_index(
```

```
 ARIMA(1,1,1)(0,0,0)[0] intercept   : AIC=4240.160, Time=0.43 sec
 ARIMA(0,1,0)(0,0,0)[0] intercept   : AIC=4419.821, Time=0.04 sec
 ARIMA(1,1,0)(0,0,0)[0] intercept   : AIC=4409.272, Time=0.10 sec
 ARIMA(0,1,1)(0,0,0)[0] intercept   : AIC=4345.075, Time=0.20 sec
 ARIMA(0,1,0)(0,0,0)[0]             : AIC=4417.821, Time=0.03 sec
 ARIMA(2,1,1)(0,0,0)[0] intercept   : AIC=4222.977, Time=0.67 sec
 ARIMA(2,1,0)(0,0,0)[0] intercept   : AIC=4285.040, Time=0.21 sec
 ARIMA(3,1,1)(0,0,0)[0] intercept   : AIC=4196.693, Time=2.93 sec
 ARIMA(3,1,0)(0,0,0)[0] intercept   : AIC=4277.871, Time=0.71 sec
 ARIMA(3,1,2)(0,0,0)[0] intercept   : AIC=4196.364, Time=2.03 sec
 ARIMA(2,1,2)(0,0,0)[0] intercept   : AIC=4198.951, Time=0.85 sec
 ARIMA(3,1,3)(0,0,0)[0] intercept   : AIC=4200.413, Time=1.26 sec
 ARIMA(2,1,3)(0,0,0)[0] intercept   : AIC=inf, Time=1.79 sec
 ARIMA(3,1,2)(0,0,0)[0]             : AIC=4194.989, Time=0.49 sec
 ARIMA(2,1,2)(0,0,0)[0]             : AIC=4197.308, Time=0.34 sec
 ARIMA(3,1,1)(0,0,0)[0]             : AIC=4195.433, Time=0.45 sec
 ARIMA(3,1,3)(0,0,0)[0]             : AIC=4198.847, Time=0.74 sec
 ARIMA(2,1,1)(0,0,0)[0]             : AIC=4221.050, Time=0.26 sec
 ARIMA(2,1,3)(0,0,0)[0]             : AIC=inf, Time=1.19 sec

Best model:  ARIMA(3,1,2)(0,0,0)[0]
Total fit time: 14.765 seconds
Performing stepwise search to minimize aic
 ARIMA(1,0,1)(0,0,0)[0]             : AIC=5212.629, Time=0.09 sec
 ARIMA(0,0,0)(0,0,0)[0]             : AIC=5573.796, Time=0.03 sec
```

/usr/local/lib/python3.10/dist-packages/statsmodels/tsa/base/
tsa_model.py:836: ValueWarning: No supported index is available.
Prediction results will be given with an integer index beginning at
`start`.
  return get_prediction_index(
/usr/local/lib/python3.10/dist-packages/statsmodels/tsa/base/tsa_model
.py:836: FutureWarning: No supported index is available. In the next
version, calling this method in a model without a supported index will
result in an exception.
  return get_prediction_index(

```
 ARIMA(1,0,0)(0,0,0)[0]             : AIC=5217.256, Time=0.06 sec
 ARIMA(0,0,1)(0,0,0)[0]             : AIC=5277.733, Time=0.07 sec
 ARIMA(2,0,1)(0,0,0)[0]             : AIC=5209.634, Time=0.16 sec
 ARIMA(2,0,0)(0,0,0)[0]             : AIC=5216.053, Time=0.09 sec
 ARIMA(3,0,1)(0,0,0)[0]             : AIC=5177.955, Time=0.32 sec
 ARIMA(3,0,0)(0,0,0)[0]             : AIC=5191.905, Time=0.12 sec
 ARIMA(3,0,2)(0,0,0)[0]             : AIC=5177.832, Time=0.46 sec
 ARIMA(2,0,2)(0,0,0)[0]             : AIC=5175.867, Time=1.15 sec
 ARIMA(1,0,2)(0,0,0)[0]             : AIC=5177.545, Time=1.06 sec
 ARIMA(2,0,3)(0,0,0)[0]             : AIC=5177.562, Time=2.42 sec
 ARIMA(1,0,3)(0,0,0)[0]             : AIC=5175.675, Time=0.29 sec
 ARIMA(0,0,3)(0,0,0)[0]             : AIC=5227.194, Time=0.13 sec
 ARIMA(0,0,2)(0,0,0)[0]             : AIC=5235.368, Time=0.12 sec
```

```
 ARIMA(1,0,3)(0,0,0)[0] intercept   : AIC=5164.513, Time=0.82 sec
 ARIMA(0,0,3)(0,0,0)[0] intercept   : AIC=5176.190, Time=0.58 sec
 ARIMA(1,0,2)(0,0,0)[0] intercept   : AIC=5164.068, Time=0.60 sec
 ARIMA(0,0,2)(0,0,0)[0] intercept   : AIC=5176.894, Time=0.40 sec
 ARIMA(1,0,1)(0,0,0)[0] intercept   : AIC=5171.522, Time=0.40 sec
 ARIMA(2,0,2)(0,0,0)[0] intercept   : AIC=5164.892, Time=0.72 sec
 ARIMA(0,0,1)(0,0,0)[0] intercept   : AIC=5197.802, Time=0.24 sec
 ARIMA(2,0,1)(0,0,0)[0] intercept   : AIC=5172.076, Time=0.50 sec
 ARIMA(2,0,3)(0,0,0)[0] intercept   : AIC=5165.739, Time=1.06 sec

Best model:  ARIMA(1,0,2)(0,0,0)[0] intercept
Total fit time: 11.951 seconds
Performing stepwise search to minimize aic
 ARIMA(1,0,1)(0,0,0)[0]             : AIC=3296.447, Time=0.09 sec
 ARIMA(0,0,0)(0,0,0)[0]             : AIC=4079.676, Time=0.02 sec
 ARIMA(1,0,0)(0,0,0)[0]             : AIC=3316.797, Time=0.05 sec

/usr/local/lib/python3.10/dist-packages/statsmodels/tsa/base/
tsa_model.py:836: ValueWarning: No supported index is available.
Prediction results will be given with an integer index beginning at
`start`.
  return get_prediction_index(
/usr/local/lib/python3.10/dist-packages/statsmodels/tsa/base/tsa_model
.py:836: FutureWarning: No supported index is available. In the next
version, calling this method in a model without a supported index will
result in an exception.
  return get_prediction_index(


 ARIMA(0,0,1)(0,0,0)[0]             : AIC=3684.133, Time=0.09 sec
 ARIMA(2,0,1)(0,0,0)[0]             : AIC=3298.239, Time=0.14 sec
 ARIMA(1,0,2)(0,0,0)[0]             : AIC=3298.028, Time=0.14 sec
 ARIMA(0,0,2)(0,0,0)[0]             : AIC=3551.327, Time=0.12 sec
 ARIMA(2,0,0)(0,0,0)[0]             : AIC=3297.321, Time=0.09 sec
 ARIMA(2,0,2)(0,0,0)[0]             : AIC=3299.392, Time=0.20 sec
 ARIMA(1,0,1)(0,0,0)[0] intercept   : AIC=3291.986, Time=0.17 sec
 ARIMA(0,0,1)(0,0,0)[0] intercept   : AIC=3613.919, Time=0.18 sec
 ARIMA(1,0,0)(0,0,0)[0] intercept   : AIC=3308.772, Time=0.09 sec
 ARIMA(2,0,1)(0,0,0)[0] intercept   : AIC=3293.666, Time=0.30 sec
 ARIMA(1,0,2)(0,0,0)[0] intercept   : AIC=3293.277, Time=0.30 sec
 ARIMA(0,0,0)(0,0,0)[0] intercept   : AIC=3975.989, Time=0.04 sec
 ARIMA(0,0,2)(0,0,0)[0] intercept   : AIC=3499.306, Time=0.26 sec
 ARIMA(2,0,0)(0,0,0)[0] intercept   : AIC=3292.325, Time=0.16 sec
 ARIMA(2,0,2)(0,0,0)[0] intercept   : AIC=3295.063, Time=0.57 sec

Best model:  ARIMA(1,0,1)(0,0,0)[0] intercept
Total fit time: 3.056 seconds
Performing stepwise search to minimize aic
 ARIMA(1,0,1)(0,0,0)[0]             : AIC=3156.211, Time=0.12 sec
 ARIMA(0,0,0)(0,0,0)[0]             : AIC=3583.162, Time=0.02 sec
```

```
/usr/local/lib/python3.10/dist-packages/statsmodels/tsa/base/
tsa_model.py:836: ValueWarning: No supported index is available.
Prediction results will be given with an integer index beginning at
`start`.
  return get_prediction_index(
/usr/local/lib/python3.10/dist-packages/statsmodels/tsa/base/tsa_model
.py:836: FutureWarning: No supported index is available. In the next
version, calling this method in a model without a supported index will
result in an exception.
  return get_prediction_index(

 ARIMA(1,0,0)(0,0,0)[0]             : AIC=3215.788, Time=0.06 sec
 ARIMA(0,0,1)(0,0,0)[0]             : AIC=3364.605, Time=0.06 sec
 ARIMA(2,0,1)(0,0,0)[0]             : AIC=3125.611, Time=0.22 sec
 ARIMA(2,0,0)(0,0,0)[0]             : AIC=3186.694, Time=0.07 sec
 ARIMA(3,0,1)(0,0,0)[0]             : AIC=3127.191, Time=0.45 sec
 ARIMA(2,0,2)(0,0,0)[0]             : AIC=3127.195, Time=0.79 sec
 ARIMA(1,0,2)(0,0,0)[0]             : AIC=3130.634, Time=1.20 sec
 ARIMA(3,0,0)(0,0,0)[0]             : AIC=3173.947, Time=0.34 sec
 ARIMA(3,0,2)(0,0,0)[0]             : AIC=3128.983, Time=1.85 sec
 ARIMA(2,0,1)(0,0,0)[0] intercept   : AIC=3117.429, Time=0.67 sec
 ARIMA(1,0,1)(0,0,0)[0] intercept   : AIC=3126.433, Time=0.26 sec
 ARIMA(2,0,0)(0,0,0)[0] intercept   : AIC=3129.770, Time=0.18 sec
 ARIMA(3,0,1)(0,0,0)[0] intercept   : AIC=3119.403, Time=1.05 sec
 ARIMA(2,0,2)(0,0,0)[0] intercept   : AIC=3119.407, Time=1.01 sec
 ARIMA(1,0,0)(0,0,0)[0] intercept   : AIC=3135.654, Time=0.12 sec
 ARIMA(1,0,2)(0,0,0)[0] intercept   : AIC=3119.881, Time=0.59 sec
 ARIMA(3,0,0)(0,0,0)[0] intercept   : AIC=3128.712, Time=0.25 sec
 ARIMA(3,0,2)(0,0,0)[0] intercept   : AIC=3120.994, Time=1.63 sec

Best model:  ARIMA(2,0,1)(0,0,0)[0] intercept
Total fit time: 11.014 seconds
Performing stepwise search to minimize aic

/usr/local/lib/python3.10/dist-packages/statsmodels/tsa/base/
tsa_model.py:836: ValueWarning: No supported index is available.
Prediction results will be given with an integer index beginning at
`start`.
  return get_prediction_index(
/usr/local/lib/python3.10/dist-packages/statsmodels/tsa/base/tsa_model
.py:836: FutureWarning: No supported index is available. In the next
version, calling this method in a model without a supported index will
result in an exception.
  return get_prediction_index(

 ARIMA(1,1,1)(0,0,0)[0] intercept   : AIC=3501.356, Time=0.23 sec
 ARIMA(0,1,0)(0,0,0)[0] intercept   : AIC=3706.333, Time=0.04 sec
 ARIMA(1,1,0)(0,0,0)[0] intercept   : AIC=3590.836, Time=0.10 sec
 ARIMA(0,1,1)(0,0,0)[0] intercept   : AIC=3503.147, Time=0.14 sec
 ARIMA(0,1,0)(0,0,0)[0]             : AIC=3704.347, Time=0.04 sec
```

```
 ARIMA(2,1,1)(0,0,0)[0] intercept   : AIC=3503.340, Time=0.68 sec
 ARIMA(1,1,2)(0,0,0)[0] intercept   : AIC=3503.349, Time=0.38 sec
 ARIMA(0,1,2)(0,0,0)[0] intercept   : AIC=3501.409, Time=0.22 sec
 ARIMA(2,1,0)(0,0,0)[0] intercept   : AIC=3552.137, Time=0.17 sec
 ARIMA(2,1,2)(0,0,0)[0] intercept   : AIC=3504.489, Time=0.78 sec
 ARIMA(1,1,1)(0,0,0)[0]             : AIC=3499.513, Time=0.14 sec
 ARIMA(0,1,1)(0,0,0)[0]             : AIC=3501.255, Time=0.06 sec
 ARIMA(1,1,0)(0,0,0)[0]             : AIC=3588.856, Time=0.18 sec
 ARIMA(2,1,1)(0,0,0)[0]             : AIC=3501.491, Time=0.29 sec
 ARIMA(1,1,2)(0,0,0)[0]             : AIC=3501.503, Time=0.20 sec
 ARIMA(0,1,2)(0,0,0)[0]             : AIC=3499.557, Time=0.08 sec
 ARIMA(2,1,0)(0,0,0)[0]             : AIC=3550.164, Time=0.09 sec
 ARIMA(2,1,2)(0,0,0)[0]             : AIC=3502.654, Time=0.61 sec

Best model:  ARIMA(1,1,1)(0,0,0)[0]
Total fit time: 4.465 seconds
Performing stepwise search to minimize aic

/usr/local/lib/python3.10/dist-packages/statsmodels/tsa/base/
tsa_model.py:836: ValueWarning: No supported index is available.
Prediction results will be given with an integer index beginning at
`start`.
  return get_prediction_index(
/usr/local/lib/python3.10/dist-packages/statsmodels/tsa/base/tsa_model
.py:836: FutureWarning: No supported index is available. In the next
version, calling this method in a model without a supported index will
result in an exception.
  return get_prediction_index(

 ARIMA(1,1,1)(0,0,0)[0] intercept   : AIC=4251.228, Time=1.05 sec
 ARIMA(0,1,0)(0,0,0)[0] intercept   : AIC=4338.184, Time=0.10 sec
 ARIMA(1,1,0)(0,0,0)[0] intercept   : AIC=4292.938, Time=0.14 sec
 ARIMA(0,1,1)(0,0,0)[0] intercept   : AIC=4260.424, Time=0.34 sec
 ARIMA(0,1,0)(0,0,0)[0]             : AIC=4336.184, Time=0.06 sec
 ARIMA(2,1,1)(0,0,0)[0] intercept   : AIC=inf, Time=2.93 sec
 ARIMA(1,1,2)(0,0,0)[0] intercept   : AIC=4251.583, Time=0.41 sec
 ARIMA(0,1,2)(0,0,0)[0] intercept   : AIC=4249.605, Time=0.21 sec
 ARIMA(0,1,3)(0,0,0)[0] intercept   : AIC=4251.534, Time=0.38 sec
 ARIMA(1,1,3)(0,0,0)[0] intercept   : AIC=4249.941, Time=0.96 sec
 ARIMA(0,1,2)(0,0,0)[0]             : AIC=4247.606, Time=0.13 sec
 ARIMA(0,1,1)(0,0,0)[0]             : AIC=4258.425, Time=0.06 sec
 ARIMA(1,1,2)(0,0,0)[0]             : AIC=4249.584, Time=0.18 sec
 ARIMA(0,1,3)(0,0,0)[0]             : AIC=4249.535, Time=0.15 sec
 ARIMA(1,1,1)(0,0,0)[0]             : AIC=4249.229, Time=0.19 sec
 ARIMA(1,1,3)(0,0,0)[0]             : AIC=4247.943, Time=0.44 sec

Best model:  ARIMA(0,1,2)(0,0,0)[0]
Total fit time: 7.770 seconds
Performing stepwise search to minimize aic
```

```
/usr/local/lib/python3.10/dist-packages/statsmodels/tsa/base/
tsa_model.py:836: ValueWarning: No supported index is available.
Prediction results will be given with an integer index beginning at
`start`.
  return get_prediction_index(
/usr/local/lib/python3.10/dist-packages/statsmodels/tsa/base/tsa_model
.py:836: FutureWarning: No supported index is available. In the next
version, calling this method in a model without a supported index will
result in an exception.
  return get_prediction_index(

 ARIMA(1,1,1)(0,0,0)[0] intercept   : AIC=3474.759, Time=0.26 sec
 ARIMA(0,1,0)(0,0,0)[0] intercept   : AIC=3637.472, Time=0.04 sec
 ARIMA(1,1,0)(0,0,0)[0] intercept   : AIC=3558.880, Time=0.10 sec
 ARIMA(0,1,1)(0,0,0)[0] intercept   : AIC=3485.479, Time=0.14 sec
 ARIMA(0,1,0)(0,0,0)[0]             : AIC=3635.472, Time=0.03 sec
 ARIMA(2,1,1)(0,0,0)[0] intercept   : AIC=inf, Time=1.23 sec
 ARIMA(1,1,2)(0,0,0)[0] intercept   : AIC=3475.006, Time=0.35 sec
 ARIMA(0,1,2)(0,0,0)[0] intercept   : AIC=3474.501, Time=0.19 sec
 ARIMA(0,1,3)(0,0,0)[0] intercept   : AIC=3476.269, Time=0.29 sec
 ARIMA(1,1,3)(0,0,0)[0] intercept   : AIC=3474.360, Time=0.76 sec
 ARIMA(2,1,3)(0,0,0)[0] intercept   : AIC=inf, Time=1.60 sec
 ARIMA(2,1,2)(0,0,0)[0] intercept   : AIC=3473.788, Time=0.68 sec
 ARIMA(3,1,2)(0,0,0)[0] intercept   : AIC=inf, Time=4.59 sec
 ARIMA(3,1,1)(0,0,0)[0] intercept   : AIC=inf, Time=1.63 sec
 ARIMA(3,1,3)(0,0,0)[0] intercept   : AIC=inf, Time=1.97 sec
 ARIMA(2,1,2)(0,0,0)[0]             : AIC=3471.788, Time=0.34 sec
 ARIMA(1,1,2)(0,0,0)[0]             : AIC=3473.006, Time=0.17 sec
 ARIMA(2,1,1)(0,0,0)[0]             : AIC=inf, Time=0.43 sec
 ARIMA(3,1,2)(0,0,0)[0]             : AIC=inf, Time=1.01 sec
 ARIMA(2,1,3)(0,0,0)[0]             : AIC=inf, Time=1.32 sec
 ARIMA(1,1,1)(0,0,0)[0]             : AIC=3472.759, Time=0.11 sec
 ARIMA(1,1,3)(0,0,0)[0]             : AIC=3472.360, Time=0.40 sec
 ARIMA(3,1,1)(0,0,0)[0]             : AIC=inf, Time=0.50 sec
 ARIMA(3,1,3)(0,0,0)[0]             : AIC=inf, Time=1.67 sec

Best model:  ARIMA(2,1,2)(0,0,0)[0]
Total fit time: 19.859 seconds
Performing stepwise search to minimize aic

/usr/local/lib/python3.10/dist-packages/statsmodels/tsa/base/
tsa_model.py:836: ValueWarning: No supported index is available.
Prediction results will be given with an integer index beginning at
`start`.
  return get_prediction_index(
/usr/local/lib/python3.10/dist-packages/statsmodels/tsa/base/tsa_model
.py:836: FutureWarning: No supported index is available. In the next
version, calling this method in a model without a supported index will
result in an exception.
  return get_prediction_index(
```

```
 ARIMA(1,1,1)(0,0,0)[0] intercept   : AIC=2492.400, Time=0.29 sec
 ARIMA(0,1,0)(0,0,0)[0] intercept   : AIC=2620.210, Time=0.03 sec
 ARIMA(1,1,0)(0,0,0)[0] intercept   : AIC=2555.966, Time=0.09 sec
 ARIMA(0,1,1)(0,0,0)[0] intercept   : AIC=2510.580, Time=0.15 sec
 ARIMA(0,1,0)(0,0,0)[0]             : AIC=2618.211, Time=0.03 sec
 ARIMA(2,1,1)(0,0,0)[0] intercept   : AIC=2489.238, Time=2.11 sec
 ARIMA(2,1,0)(0,0,0)[0] intercept   : AIC=2518.260, Time=0.41 sec
 ARIMA(3,1,1)(0,0,0)[0] intercept   : AIC=inf, Time=2.81 sec
 ARIMA(2,1,2)(0,0,0)[0] intercept   : AIC=2494.163, Time=0.87 sec
 ARIMA(1,1,2)(0,0,0)[0] intercept   : AIC=inf, Time=1.32 sec
 ARIMA(3,1,0)(0,0,0)[0] intercept   : AIC=2516.741, Time=0.19 sec
 ARIMA(3,1,2)(0,0,0)[0] intercept   : AIC=inf, Time=1.54 sec
 ARIMA(2,1,1)(0,0,0)[0]             : AIC=2487.265, Time=0.20 sec
 ARIMA(1,1,1)(0,0,0)[0]             : AIC=2490.409, Time=0.12 sec
 ARIMA(2,1,0)(0,0,0)[0]             : AIC=2516.263, Time=0.07 sec
 ARIMA(3,1,1)(0,0,0)[0]             : AIC=inf, Time=0.48 sec
 ARIMA(2,1,2)(0,0,0)[0]             : AIC=2492.171, Time=0.43 sec
 ARIMA(1,1,0)(0,0,0)[0]             : AIC=2553.967, Time=0.05 sec
 ARIMA(1,1,2)(0,0,0)[0]             : AIC=inf, Time=0.48 sec
 ARIMA(3,1,0)(0,0,0)[0]             : AIC=2514.744, Time=0.09 sec
 ARIMA(3,1,2)(0,0,0)[0]             : AIC=inf, Time=0.78 sec

Best model:  ARIMA(2,1,1)(0,0,0)[0]
Total fit time: 12.576 seconds
Performing stepwise search to minimize aic

/usr/local/lib/python3.10/dist-packages/statsmodels/tsa/base/
tsa_model.py:836: ValueWarning: No supported index is available.
Prediction results will be given with an integer index beginning at
`start`.
  return get_prediction_index(
/usr/local/lib/python3.10/dist-packages/statsmodels/tsa/base/tsa_model
.py:836: FutureWarning: No supported index is available. In the next
version, calling this method in a model without a supported index will
result in an exception.
  return get_prediction_index(

 ARIMA(1,1,1)(0,0,0)[0] intercept   : AIC=5635.516, Time=0.36 sec
 ARIMA(0,1,0)(0,0,0)[0] intercept   : AIC=5756.950, Time=0.04 sec
 ARIMA(1,1,0)(0,0,0)[0] intercept   : AIC=5725.394, Time=0.08 sec
 ARIMA(0,1,1)(0,0,0)[0] intercept   : AIC=5705.746, Time=0.20 sec
 ARIMA(0,1,0)(0,0,0)[0]             : AIC=5754.950, Time=0.03 sec
 ARIMA(2,1,1)(0,0,0)[0] intercept   : AIC=5637.491, Time=0.51 sec
 ARIMA(1,1,2)(0,0,0)[0] intercept   : AIC=5637.490, Time=0.48 sec
 ARIMA(0,1,2)(0,0,0)[0] intercept   : AIC=5663.798, Time=0.35 sec
 ARIMA(2,1,0)(0,0,0)[0] intercept   : AIC=5705.823, Time=0.25 sec
 ARIMA(2,1,2)(0,0,0)[0] intercept   : AIC=5636.264, Time=4.47 sec
 ARIMA(1,1,1)(0,0,0)[0]             : AIC=5633.518, Time=0.16 sec
 ARIMA(0,1,1)(0,0,0)[0]             : AIC=5703.746, Time=0.11 sec
 ARIMA(1,1,0)(0,0,0)[0]             : AIC=5723.394, Time=0.05 sec
```

```
 ARIMA(2,1,1)(0,0,0)[0]              : AIC=5635.493, Time=0.32 sec
 ARIMA(1,1,2)(0,0,0)[0]              : AIC=5635.492, Time=0.25 sec
 ARIMA(0,1,2)(0,0,0)[0]              : AIC=5661.799, Time=0.15 sec
 ARIMA(2,1,0)(0,0,0)[0]              : AIC=5703.823, Time=0.12 sec
 ARIMA(2,1,2)(0,0,0)[0]              : AIC=5634.266, Time=0.75 sec

Best model:  ARIMA(1,1,1)(0,0,0)[0]
Total fit time: 8.678 seconds
Performing stepwise search to minimize aic
 ARIMA(1,0,1)(0,0,0)[0]              : AIC=3449.599, Time=0.10 sec
 ARIMA(0,0,0)(0,0,0)[0]              : AIC=3888.335, Time=0.02 sec

/usr/local/lib/python3.10/dist-packages/statsmodels/tsa/base/
tsa_model.py:836: ValueWarning: No supported index is available.
Prediction results will be given with an integer index beginning at
`start`.
  return get_prediction_index(
/usr/local/lib/python3.10/dist-packages/statsmodels/tsa/base/tsa_model
.py:836: FutureWarning: No supported index is available. In the next
version, calling this method in a model without a supported index will
result in an exception.
  return get_prediction_index(

 ARIMA(1,0,0)(0,0,0)[0]              : AIC=3634.917, Time=0.06 sec
 ARIMA(0,0,1)(0,0,0)[0]              : AIC=3774.818, Time=0.07 sec
 ARIMA(2,0,1)(0,0,0)[0]              : AIC=3406.355, Time=0.10 sec
 ARIMA(2,0,0)(0,0,0)[0]              : AIC=3414.419, Time=0.08 sec
 ARIMA(3,0,1)(0,0,0)[0]              : AIC=3402.009, Time=0.30 sec
 ARIMA(3,0,0)(0,0,0)[0]              : AIC=3409.362, Time=0.10 sec
 ARIMA(3,0,2)(0,0,0)[0]              : AIC=3404.008, Time=0.55 sec
 ARIMA(2,0,2)(0,0,0)[0]              : AIC=3404.923, Time=0.15 sec
 ARIMA(3,0,1)(0,0,0)[0] intercept    : AIC=3392.337, Time=0.67 sec
 ARIMA(2,0,1)(0,0,0)[0] intercept    : AIC=3392.615, Time=0.27 sec
 ARIMA(3,0,0)(0,0,0)[0] intercept    : AIC=3393.574, Time=0.28 sec
 ARIMA(3,0,2)(0,0,0)[0] intercept    : AIC=3394.227, Time=0.99 sec
 ARIMA(2,0,0)(0,0,0)[0] intercept    : AIC=3395.140, Time=0.16 sec
 ARIMA(2,0,2)(0,0,0)[0] intercept    : AIC=3393.157, Time=0.47 sec

Best model:  ARIMA(3,0,1)(0,0,0)[0] intercept
Total fit time: 4.394 seconds
Performing stepwise search to minimize aic
 ARIMA(1,0,1)(0,0,0)[0]              : AIC=1861.545, Time=0.08 sec
 ARIMA(0,0,0)(0,0,0)[0]              : AIC=2246.160, Time=0.02 sec
 ARIMA(1,0,0)(0,0,0)[0]              : AIC=1914.872, Time=0.04 sec

/usr/local/lib/python3.10/dist-packages/statsmodels/tsa/base/
tsa_model.py:836: ValueWarning: No supported index is available.
Prediction results will be given with an integer index beginning at
`start`.
  return get_prediction_index(
```

```
/usr/local/lib/python3.10/dist-packages/statsmodels/tsa/base/tsa_model
.py:836: FutureWarning: No supported index is available. In the next
version, calling this method in a model without a supported index will
result in an exception.
  return get_prediction_index(

 ARIMA(0,0,1)(0,0,0)[0]                 : AIC=2062.697, Time=0.06 sec
 ARIMA(2,0,1)(0,0,0)[0]                 : AIC=1862.366, Time=0.15 sec
 ARIMA(1,0,2)(0,0,0)[0]                 : AIC=1862.514, Time=0.12 sec
 ARIMA(0,0,2)(0,0,0)[0]                 : AIC=1981.863, Time=0.08 sec
 ARIMA(2,0,0)(0,0,0)[0]                 : AIC=1864.805, Time=0.07 sec
 ARIMA(2,0,2)(0,0,0)[0]                 : AIC=1864.365, Time=0.26 sec
 ARIMA(1,0,1)(0,0,0)[0] intercept       : AIC=1845.804, Time=0.21 sec
 ARIMA(0,0,1)(0,0,0)[0] intercept       : AIC=1958.043, Time=0.14 sec
 ARIMA(1,0,0)(0,0,0)[0] intercept       : AIC=1877.462, Time=0.12 sec
 ARIMA(2,0,1)(0,0,0)[0] intercept       : AIC=1844.801, Time=0.24 sec
 ARIMA(2,0,0)(0,0,0)[0] intercept       : AIC=1844.066, Time=0.15 sec
 ARIMA(3,0,0)(0,0,0)[0] intercept       : AIC=1844.082, Time=0.22 sec
 ARIMA(3,0,1)(0,0,0)[0] intercept       : AIC=1842.774, Time=0.56 sec
 ARIMA(3,0,2)(0,0,0)[0] intercept       : AIC=1844.257, Time=0.75 sec
 ARIMA(2,0,2)(0,0,0)[0] intercept       : AIC=1845.587, Time=0.63 sec
 ARIMA(3,0,1)(0,0,0)[0]                 : AIC=1861.334, Time=1.57 sec

Best model:  ARIMA(3,0,1)(0,0,0)[0] intercept
Total fit time: 5.495 seconds
Performing stepwise search to minimize aic

/usr/local/lib/python3.10/dist-packages/statsmodels/tsa/base/
tsa_model.py:836: ValueWarning: No supported index is available.
Prediction results will be given with an integer index beginning at
`start`.
  return get_prediction_index(
/usr/local/lib/python3.10/dist-packages/statsmodels/tsa/base/tsa_model
.py:836: FutureWarning: No supported index is available. In the next
version, calling this method in a model without a supported index will
result in an exception.
  return get_prediction_index(

 ARIMA(1,0,1)(0,0,0)[0]                 : AIC=4386.264, Time=0.20 sec
 ARIMA(0,0,0)(0,0,0)[0]                 : AIC=5054.761, Time=0.05 sec
 ARIMA(1,0,0)(0,0,0)[0]                 : AIC=4386.665, Time=0.08 sec
 ARIMA(0,0,1)(0,0,0)[0]                 : AIC=4601.403, Time=0.29 sec
 ARIMA(2,0,1)(0,0,0)[0]                 : AIC=4354.159, Time=0.43 sec
 ARIMA(2,0,0)(0,0,0)[0]                 : AIC=4388.034, Time=0.38 sec
 ARIMA(3,0,1)(0,0,0)[0]                 : AIC=4335.644, Time=0.46 sec
 ARIMA(3,0,0)(0,0,0)[0]                 : AIC=4335.191, Time=0.16 sec
 ARIMA(3,0,0)(0,0,0)[0] intercept       : AIC=4332.957, Time=0.45 sec
 ARIMA(2,0,0)(0,0,0)[0] intercept       : AIC=4382.033, Time=0.26 sec
 ARIMA(3,0,1)(0,0,0)[0] intercept       : AIC=4332.186, Time=0.61 sec
 ARIMA(2,0,1)(0,0,0)[0] intercept       : AIC=4347.349, Time=0.50 sec
```

```
 ARIMA(3,0,2)(0,0,0)[0] intercept   : AIC=4313.680, Time=0.74 sec
 ARIMA(2,0,2)(0,0,0)[0] intercept   : AIC=4312.793, Time=0.44 sec
 ARIMA(1,0,2)(0,0,0)[0] intercept   : AIC=4311.581, Time=0.37 sec
 ARIMA(0,0,2)(0,0,0)[0] intercept   : AIC=4475.465, Time=0.32 sec
 ARIMA(1,0,1)(0,0,0)[0] intercept   : AIC=4378.569, Time=0.22 sec
 ARIMA(1,0,3)(0,0,0)[0] intercept   : AIC=4312.944, Time=0.53 sec
 ARIMA(0,0,1)(0,0,0)[0] intercept   : AIC=4546.037, Time=0.17 sec
 ARIMA(0,0,3)(0,0,0)[0] intercept   : AIC=4421.231, Time=0.47 sec
 ARIMA(2,0,3)(0,0,0)[0] intercept   : AIC=4313.722, Time=1.44 sec
 ARIMA(1,0,2)(0,0,0)[0]             : AIC=4311.728, Time=0.17 sec

Best model:  ARIMA(1,0,2)(0,0,0)[0] intercept
Total fit time: 8.778 seconds

/usr/local/lib/python3.10/dist-packages/statsmodels/tsa/base/
tsa_model.py:836: ValueWarning: No supported index is available.
Prediction results will be given with an integer index beginning at
`start`.
  return get_prediction_index(
/usr/local/lib/python3.10/dist-packages/statsmodels/tsa/base/tsa_model
.py:836: FutureWarning: No supported index is available. In the next
version, calling this method in a model without a supported index will
result in an exception.
  return get_prediction_index(

Performing stepwise search to minimize aic
 ARIMA(1,0,1)(0,0,0)[0]             : AIC=6049.424, Time=0.11 sec
 ARIMA(0,0,0)(0,0,0)[0]             : AIC=6881.204, Time=0.02 sec
 ARIMA(1,0,0)(0,0,0)[0]             : AIC=6049.834, Time=0.07 sec
 ARIMA(0,0,1)(0,0,0)[0]             : AIC=6406.194, Time=0.10 sec
 ARIMA(2,0,1)(0,0,0)[0]             : AIC=6041.790, Time=0.22 sec
 ARIMA(2,0,0)(0,0,0)[0]             : AIC=6050.551, Time=0.08 sec
 ARIMA(3,0,1)(0,0,0)[0]             : AIC=6024.645, Time=0.28 sec
 ARIMA(3,0,0)(0,0,0)[0]             : AIC=6026.950, Time=0.17 sec
 ARIMA(3,0,2)(0,0,0)[0]             : AIC=6014.386, Time=0.38 sec
 ARIMA(2,0,2)(0,0,0)[0]             : AIC=6019.253, Time=0.30 sec
 ARIMA(3,0,3)(0,0,0)[0]             : AIC=6014.211, Time=0.84 sec
 ARIMA(2,0,3)(0,0,0)[0]             : AIC=6019.605, Time=0.37 sec
 ARIMA(3,0,3)(0,0,0)[0] intercept   : AIC=6011.403, Time=4.83 sec
 ARIMA(2,0,3)(0,0,0)[0] intercept   : AIC=6011.893, Time=0.99 sec
 ARIMA(3,0,2)(0,0,0)[0] intercept   : AIC=6010.088, Time=1.16 sec
 ARIMA(2,0,2)(0,0,0)[0] intercept   : AIC=6010.384, Time=0.54 sec
 ARIMA(3,0,1)(0,0,0)[0] intercept   : AIC=6012.652, Time=0.91 sec
 ARIMA(2,0,1)(0,0,0)[0] intercept   : AIC=6023.645, Time=0.60 sec

Best model:  ARIMA(3,0,2)(0,0,0)[0] intercept
Total fit time: 11.976 seconds
Performing stepwise search to minimize aic
```

```
/usr/local/lib/python3.10/dist-packages/statsmodels/tsa/base/
tsa_model.py:836: ValueWarning: No supported index is available.
Prediction results will be given with an integer index beginning at
`start`.
  return get_prediction_index(
/usr/local/lib/python3.10/dist-packages/statsmodels/tsa/base/tsa_model
.py:836: FutureWarning: No supported index is available. In the next
version, calling this method in a model without a supported index will
result in an exception.
  return get_prediction_index(

 ARIMA(1,1,1)(0,0,0)[0] intercept   : AIC=1640.318, Time=0.19 sec
 ARIMA(0,1,0)(0,0,0)[0] intercept   : AIC=1782.310, Time=0.03 sec
 ARIMA(1,1,0)(0,0,0)[0] intercept   : AIC=1711.233, Time=0.07 sec
 ARIMA(0,1,1)(0,0,0)[0] intercept   : AIC=1638.935, Time=0.10 sec
 ARIMA(0,1,0)(0,0,0)[0]             : AIC=1780.310, Time=0.02 sec
 ARIMA(0,1,2)(0,0,0)[0] intercept   : AIC=1640.317, Time=0.15 sec
 ARIMA(1,1,2)(0,0,0)[0] intercept   : AIC=1642.317, Time=0.39 sec
 ARIMA(0,1,1)(0,0,0)[0]             : AIC=1636.935, Time=0.04 sec
 ARIMA(1,1,1)(0,0,0)[0]             : AIC=1638.318, Time=0.12 sec
 ARIMA(0,1,2)(0,0,0)[0]             : AIC=1638.317, Time=0.07 sec
 ARIMA(1,1,0)(0,0,0)[0]             : AIC=1709.233, Time=0.04 sec
 ARIMA(1,1,2)(0,0,0)[0]             : AIC=1640.317, Time=0.19 sec

Best model:  ARIMA(0,1,1)(0,0,0)[0]
Total fit time: 1.432 seconds
Warning: Invalid prediction range for item B0BDRWGMJY. Skipping
forecast.
Performing stepwise search to minimize aic
 ARIMA(1,1,1)(0,0,0)[0] intercept   : AIC=3247.071, Time=0.20 sec
 ARIMA(0,1,0)(0,0,0)[0] intercept   : AIC=3317.318, Time=0.03 sec
 ARIMA(1,1,0)(0,0,0)[0] intercept   : AIC=3261.068, Time=0.11 sec
 ARIMA(0,1,1)(0,0,0)[0] intercept   : AIC=3245.902, Time=0.17 sec
 ARIMA(0,1,0)(0,0,0)[0]             : AIC=3315.324, Time=0.02 sec
 ARIMA(0,1,2)(0,0,0)[0] intercept   : AIC=3245.583, Time=0.23 sec
 ARIMA(1,1,2)(0,0,0)[0] intercept   : AIC=3227.811, Time=0.26 sec
 ARIMA(2,1,2)(0,0,0)[0] intercept   : AIC=3203.752, Time=0.52 sec
 ARIMA(2,1,1)(0,0,0)[0] intercept   : AIC=3201.752, Time=0.42 sec
 ARIMA(2,1,0)(0,0,0)[0] intercept   : AIC=3229.318, Time=0.16 sec
 ARIMA(3,1,1)(0,0,0)[0] intercept   : AIC=3203.752, Time=0.58 sec
 ARIMA(3,1,0)(0,0,0)[0] intercept   : AIC=3208.679, Time=0.24 sec
 ARIMA(3,1,2)(0,0,0)[0] intercept   : AIC=inf, Time=1.15 sec
 ARIMA(2,1,1)(0,0,0)[0]             : AIC=3199.769, Time=0.28 sec
 ARIMA(1,1,1)(0,0,0)[0]             : AIC=3245.090, Time=0.81 sec
 ARIMA(2,1,0)(0,0,0)[0]             : AIC=3227.337, Time=0.80 sec
 ARIMA(3,1,1)(0,0,0)[0]             : AIC=3201.768, Time=1.73 sec
 ARIMA(2,1,2)(0,0,0)[0]             : AIC=3201.768, Time=0.49 sec
 ARIMA(1,1,0)(0,0,0)[0]             : AIC=3259.080, Time=0.05 sec
 ARIMA(1,1,2)(0,0,0)[0]             : AIC=3225.834, Time=0.14 sec
 ARIMA(3,1,0)(0,0,0)[0]             : AIC=3206.692, Time=0.12 sec
```

```
 ARIMA(3,1,2)(0,0,0)[0]                : AIC=inf, Time=0.79 sec

Best model:  ARIMA(2,1,1)(0,0,0)[0]
Total fit time: 9.345 seconds
Performing stepwise search to minimize aic
```

```
 ARIMA(1,1,1)(0,0,0)[0] intercept   : AIC=3016.947, Time=0.22 sec
 ARIMA(0,1,0)(0,0,0)[0] intercept   : AIC=3071.717, Time=0.03 sec
 ARIMA(1,1,0)(0,0,0)[0] intercept   : AIC=3031.821, Time=0.11 sec
 ARIMA(0,1,1)(0,0,0)[0] intercept   : AIC=3015.000, Time=0.16 sec
 ARIMA(0,1,0)(0,0,0)[0]             : AIC=3069.720, Time=0.03 sec
 ARIMA(0,1,2)(0,0,0)[0] intercept   : AIC=3016.895, Time=0.24 sec
 ARIMA(1,1,2)(0,0,0)[0] intercept   : AIC=3008.030, Time=0.22 sec
 ARIMA(2,1,2)(0,0,0)[0] intercept   : AIC=3002.775, Time=0.41 sec
 ARIMA(2,1,1)(0,0,0)[0] intercept   : AIC=3001.850, Time=0.29 sec
 ARIMA(2,1,0)(0,0,0)[0] intercept   : AIC=3005.395, Time=0.15 sec
 ARIMA(3,1,1)(0,0,0)[0] intercept   : AIC=3002.428, Time=0.54 sec
 ARIMA(3,1,0)(0,0,0)[0] intercept   : AIC=3002.927, Time=0.21 sec
 ARIMA(3,1,2)(0,0,0)[0] intercept   : AIC=inf, Time=0.95 sec
 ARIMA(2,1,1)(0,0,0)[0]             : AIC=2999.858, Time=0.14 sec
 ARIMA(1,1,1)(0,0,0)[0]             : AIC=3014.958, Time=0.11 sec
 ARIMA(2,1,0)(0,0,0)[0]             : AIC=3003.406, Time=0.07 sec
 ARIMA(3,1,1)(0,0,0)[0]             : AIC=3000.437, Time=0.23 sec
 ARIMA(2,1,2)(0,0,0)[0]             : AIC=3000.784, Time=0.21 sec
 ARIMA(1,1,0)(0,0,0)[0]             : AIC=3029.826, Time=0.05 sec
 ARIMA(1,1,2)(0,0,0)[0]             : AIC=3006.043, Time=0.12 sec
 ARIMA(3,1,0)(0,0,0)[0]             : AIC=3000.935, Time=0.11 sec
 ARIMA(3,1,2)(0,0,0)[0]             : AIC=inf, Time=0.75 sec

Best model:  ARIMA(2,1,1)(0,0,0)[0]
Total fit time: 5.393 seconds
Performing stepwise search to minimize aic
 ARIMA(1,0,1)(0,0,0)[0]                : AIC=6887.816, Time=0.13 sec
 ARIMA(0,0,0)(0,0,0)[0]                : AIC=7941.508, Time=0.02 sec
```

```
  return get_prediction_index(
/usr/local/lib/python3.10/dist-packages/statsmodels/tsa/base/tsa_model
.py:836: FutureWarning: No supported index is available. In the next
version, calling this method in a model without a supported index will
result in an exception.
  return get_prediction_index(

 ARIMA(1,0,0)(0,0,0)[0]                : AIC=6886.002, Time=0.05 sec
 ARIMA(0,0,1)(0,0,0)[0]                : AIC=7382.011, Time=0.10 sec
 ARIMA(2,0,0)(0,0,0)[0]                : AIC=6887.947, Time=0.06 sec
 ARIMA(2,0,1)(0,0,0)[0]                : AIC=6862.460, Time=0.25 sec
 ARIMA(3,0,1)(0,0,0)[0]                : AIC=6819.737, Time=0.43 sec
 ARIMA(3,0,0)(0,0,0)[0]                : AIC=6829.400, Time=0.11 sec
 ARIMA(3,0,2)(0,0,0)[0]                : AIC=6805.799, Time=0.53 sec
 ARIMA(2,0,2)(0,0,0)[0]                : AIC=6804.009, Time=0.23 sec
 ARIMA(1,0,2)(0,0,0)[0]                : AIC=6802.016, Time=0.23 sec
 ARIMA(0,0,2)(0,0,0)[0]                : AIC=7189.878, Time=0.19 sec
 ARIMA(1,0,3)(0,0,0)[0]                : AIC=6804.004, Time=0.35 sec
 ARIMA(0,0,3)(0,0,0)[0]                : AIC=7077.557, Time=0.30 sec
 ARIMA(2,0,3)(0,0,0)[0]                : AIC=6806.001, Time=0.34 sec
 ARIMA(1,0,2)(0,0,0)[0] intercept      : AIC=6800.673, Time=2.13 sec
 ARIMA(0,0,2)(0,0,0)[0] intercept      : AIC=7056.267, Time=2.05 sec
 ARIMA(1,0,1)(0,0,0)[0] intercept      : AIC=6874.556, Time=0.44 sec
 ARIMA(2,0,2)(0,0,0)[0] intercept      : AIC=6802.677, Time=0.66 sec
 ARIMA(1,0,3)(0,0,0)[0] intercept      : AIC=6802.673, Time=0.70 sec
 ARIMA(0,0,1)(0,0,0)[0] intercept      : AIC=7187.316, Time=0.32 sec
 ARIMA(0,0,3)(0,0,0)[0] intercept      : AIC=6975.232, Time=0.53 sec
 ARIMA(2,0,1)(0,0,0)[0] intercept      : AIC=6848.782, Time=0.69 sec
 ARIMA(2,0,3)(0,0,0)[0] intercept      : AIC=inf, Time=1.45 sec

Best model:  ARIMA(1,0,2)(0,0,0)[0] intercept
Total fit time: 12.320 seconds
Performing stepwise search to minimize aic
 ARIMA(1,0,1)(0,0,0)[0]                : AIC=2633.013, Time=0.07 sec
 ARIMA(0,0,0)(0,0,0)[0]                : AIC=3160.905, Time=0.02 sec
 ARIMA(1,0,0)(0,0,0)[0]                : AIC=2675.054, Time=0.04 sec

/usr/local/lib/python3.10/dist-packages/statsmodels/tsa/base/
tsa_model.py:836: ValueWarning: No supported index is available.
Prediction results will be given with an integer index beginning at
`start`.
  return get_prediction_index(
/usr/local/lib/python3.10/dist-packages/statsmodels/tsa/base/tsa_model
.py:836: FutureWarning: No supported index is available. In the next
version, calling this method in a model without a supported index will
result in an exception.
  return get_prediction_index(

 ARIMA(0,0,1)(0,0,0)[0]                : AIC=2930.882, Time=0.08 sec
 ARIMA(2,0,1)(0,0,0)[0]                : AIC=2634.494, Time=0.16 sec
```

```
 ARIMA(1,0,2)(0,0,0)[0]                  : AIC=2633.376, Time=0.09 sec
 ARIMA(0,0,2)(0,0,0)[0]                  : AIC=2868.915, Time=0.09 sec
 ARIMA(2,0,0)(0,0,0)[0]                  : AIC=2644.268, Time=0.08 sec
 ARIMA(2,0,2)(0,0,0)[0]                  : AIC=2632.376, Time=0.21 sec
 ARIMA(3,0,2)(0,0,0)[0]                  : AIC=2615.153, Time=0.17 sec
 ARIMA(3,0,1)(0,0,0)[0]                  : AIC=2614.885, Time=0.20 sec
 ARIMA(3,0,0)(0,0,0)[0]                  : AIC=2619.640, Time=0.11 sec
 ARIMA(3,0,1)(0,0,0)[0] intercept    : AIC=2615.066, Time=0.47 sec

Best model:  ARIMA(3,0,1)(0,0,0)[0]
Total fit time: 1.822 seconds
Performing stepwise search to minimize aic

/usr/local/lib/python3.10/dist-packages/statsmodels/tsa/base/
tsa_model.py:836: ValueWarning: No supported index is available.
Prediction results will be given with an integer index beginning at
`start`.
  return get_prediction_index(
/usr/local/lib/python3.10/dist-packages/statsmodels/tsa/base/tsa_model
.py:836: FutureWarning: No supported index is available. In the next
version, calling this method in a model without a supported index will
result in an exception.
  return get_prediction_index(

 ARIMA(1,1,1)(0,0,0)[0] intercept    : AIC=5361.322, Time=0.33 sec
 ARIMA(0,1,0)(0,0,0)[0] intercept    : AIC=5488.934, Time=0.03 sec
 ARIMA(1,1,0)(0,0,0)[0] intercept    : AIC=5428.521, Time=0.12 sec
 ARIMA(0,1,1)(0,0,0)[0] intercept    : AIC=5388.146, Time=0.23 sec
 ARIMA(0,1,0)(0,0,0)[0]                  : AIC=5486.938, Time=0.03 sec
 ARIMA(2,1,1)(0,0,0)[0] intercept    : AIC=5387.890, Time=0.47 sec
 ARIMA(1,1,2)(0,0,0)[0] intercept    : AIC=5361.591, Time=0.41 sec
 ARIMA(0,1,2)(0,0,0)[0] intercept    : AIC=5366.729, Time=0.24 sec
 ARIMA(2,1,0)(0,0,0)[0] intercept    : AIC=5390.642, Time=0.27 sec
 ARIMA(2,1,2)(0,0,0)[0] intercept    : AIC=5351.756, Time=0.58 sec
 ARIMA(3,1,2)(0,0,0)[0] intercept    : AIC=5340.784, Time=1.78 sec
 ARIMA(3,1,1)(0,0,0)[0] intercept    : AIC=5356.795, Time=3.10 sec
 ARIMA(3,1,3)(0,0,0)[0] intercept    : AIC=5342.684, Time=1.38 sec
 ARIMA(2,1,3)(0,0,0)[0] intercept    : AIC=5345.148, Time=0.85 sec
 ARIMA(3,1,2)(0,0,0)[0]                  : AIC=5338.926, Time=0.43 sec
 ARIMA(2,1,2)(0,0,0)[0]                  : AIC=5349.833, Time=0.34 sec
 ARIMA(3,1,1)(0,0,0)[0]                  : AIC=5354.958, Time=0.41 sec
 ARIMA(3,1,3)(0,0,0)[0]                  : AIC=5340.822, Time=0.66 sec
 ARIMA(2,1,1)(0,0,0)[0]                  : AIC=5385.901, Time=0.19 sec
 ARIMA(2,1,3)(0,0,0)[0]                  : AIC=5343.292, Time=0.45 sec

Best model:  ARIMA(3,1,2)(0,0,0)[0]
Total fit time: 12.313 seconds
Performing stepwise search to minimize aic
 ARIMA(1,0,1)(0,0,0)[0]                  : AIC=1778.469, Time=0.13 sec
```

```
/usr/local/lib/python3.10/dist-packages/statsmodels/tsa/base/
tsa_model.py:836: ValueWarning: No supported index is available.
Prediction results will be given with an integer index beginning at
`start`.
  return get_prediction_index(
/usr/local/lib/python3.10/dist-packages/statsmodels/tsa/base/tsa_model
.py:836: FutureWarning: No supported index is available. In the next
version, calling this method in a model without a supported index will
result in an exception.
  return get_prediction_index(

 ARIMA(0,0,0)(0,0,0)[0]                 : AIC=2213.440, Time=0.02 sec
 ARIMA(1,0,0)(0,0,0)[0]                 : AIC=1871.187, Time=0.04 sec
 ARIMA(0,0,1)(0,0,0)[0]                 : AIC=2027.583, Time=0.05 sec
 ARIMA(2,0,1)(0,0,0)[0]                 : AIC=1780.398, Time=0.17 sec
 ARIMA(1,0,2)(0,0,0)[0]                 : AIC=1780.405, Time=0.13 sec
 ARIMA(0,0,2)(0,0,0)[0]                 : AIC=1963.095, Time=0.10 sec
 ARIMA(2,0,0)(0,0,0)[0]                 : AIC=1803.778, Time=0.07 sec
 ARIMA(2,0,2)(0,0,0)[0]                 : AIC=1775.421, Time=0.27 sec
 ARIMA(3,0,2)(0,0,0)[0]                 : AIC=1773.774, Time=0.33 sec
 ARIMA(3,0,1)(0,0,0)[0]                 : AIC=1777.454, Time=0.19 sec
 ARIMA(3,0,3)(0,0,0)[0]                 : AIC=1775.751, Time=0.49 sec
 ARIMA(2,0,3)(0,0,0)[0]                 : AIC=1775.441, Time=0.29 sec
 ARIMA(3,0,2)(0,0,0)[0] intercept   : AIC=1764.983, Time=0.67 sec
 ARIMA(2,0,2)(0,0,0)[0] intercept   : AIC=1769.491, Time=0.83 sec
 ARIMA(3,0,1)(0,0,0)[0] intercept   : AIC=1765.121, Time=0.49 sec
 ARIMA(3,0,3)(0,0,0)[0] intercept   : AIC=1767.637, Time=0.74 sec
 ARIMA(2,0,1)(0,0,0)[0] intercept   : AIC=1773.529, Time=0.64 sec
 ARIMA(2,0,3)(0,0,0)[0] intercept   : AIC=1767.725, Time=2.03 sec

Best model:  ARIMA(3,0,2)(0,0,0)[0] intercept
Total fit time: 7.706 seconds
Performing stepwise search to minimize aic

/usr/local/lib/python3.10/dist-packages/statsmodels/tsa/base/
tsa_model.py:836: ValueWarning: No supported index is available.
Prediction results will be given with an integer index beginning at
`start`.
  return get_prediction_index(
/usr/local/lib/python3.10/dist-packages/statsmodels/tsa/base/tsa_model
.py:836: FutureWarning: No supported index is available. In the next
version, calling this method in a model without a supported index will
result in an exception.
  return get_prediction_index(

 ARIMA(1,1,1)(0,0,0)[0] intercept   : AIC=823.895, Time=1.34 sec
 ARIMA(0,1,0)(0,0,0)[0] intercept   : AIC=956.986, Time=0.06 sec
 ARIMA(1,1,0)(0,0,0)[0] intercept   : AIC=885.042, Time=0.09 sec
 ARIMA(0,1,1)(0,0,0)[0] intercept   : AIC=825.686, Time=0.31 sec
 ARIMA(0,1,0)(0,0,0)[0]                 : AIC=954.986, Time=0.03 sec
```

```
 ARIMA(2,1,1)(0,0,0)[0] intercept   : AIC=inf, Time=0.75 sec
 ARIMA(1,1,2)(0,0,0)[0] intercept   : AIC=inf, Time=0.76 sec
 ARIMA(0,1,2)(0,0,0)[0] intercept   : AIC=824.695, Time=0.19 sec
 ARIMA(2,1,0)(0,0,0)[0] intercept   : AIC=869.568, Time=0.10 sec
 ARIMA(2,1,2)(0,0,0)[0] intercept   : AIC=inf, Time=0.85 sec
 ARIMA(1,1,1)(0,0,0)[0]             : AIC=821.914, Time=0.08 sec
 ARIMA(0,1,1)(0,0,0)[0]             : AIC=823.692, Time=0.05 sec
 ARIMA(1,1,0)(0,0,0)[0]             : AIC=883.042, Time=0.04 sec
 ARIMA(2,1,1)(0,0,0)[0]             : AIC=821.064, Time=0.17 sec
 ARIMA(2,1,0)(0,0,0)[0]             : AIC=867.568, Time=0.08 sec
 ARIMA(3,1,1)(0,0,0)[0]             : AIC=822.999, Time=0.23 sec
 ARIMA(2,1,2)(0,0,0)[0]             : AIC=inf, Time=0.55 sec
 ARIMA(1,1,2)(0,0,0)[0]             : AIC=819.312, Time=0.33 sec
 ARIMA(0,1,2)(0,0,0)[0]             : AIC=822.708, Time=0.08 sec
 ARIMA(1,1,3)(0,0,0)[0]             : AIC=822.937, Time=0.27 sec
 ARIMA(0,1,3)(0,0,0)[0]             : AIC=820.993, Time=0.13 sec
 ARIMA(2,1,3)(0,0,0)[0]             : AIC=822.477, Time=0.41 sec

Best model:  ARIMA(1,1,2)(0,0,0)[0]
Total fit time: 6.931 seconds
Performing stepwise search to minimize aic
 ARIMA(1,0,1)(0,0,0)[0]                : AIC=970.544, Time=0.09 sec
 ARIMA(0,0,0)(0,0,0)[0]                : AIC=1011.953, Time=0.02 sec
```

/usr/local/lib/python3.10/dist-packages/statsmodels/tsa/base/
tsa_model.py:836: ValueWarning: No supported index is available.
Prediction results will be given with an integer index beginning at
`start`.
  return get_prediction_index(
/usr/local/lib/python3.10/dist-packages/statsmodels/tsa/base/tsa_model
.py:836: FutureWarning: No supported index is available. In the next
version, calling this method in a model without a supported index will
result in an exception.
  return get_prediction_index(

```
 ARIMA(1,0,0)(0,0,0)[0]                : AIC=977.870, Time=0.05 sec
 ARIMA(0,0,1)(0,0,0)[0]                : AIC=984.648, Time=0.03 sec
 ARIMA(2,0,1)(0,0,0)[0]                : AIC=963.223, Time=0.19 sec
 ARIMA(2,0,0)(0,0,0)[0]                : AIC=978.054, Time=0.05 sec
 ARIMA(3,0,1)(0,0,0)[0]                : AIC=965.027, Time=0.30 sec
 ARIMA(2,0,2)(0,0,0)[0]                : AIC=965.087, Time=0.26 sec
 ARIMA(1,0,2)(0,0,0)[0]                : AIC=963.265, Time=0.15 sec
 ARIMA(3,0,0)(0,0,0)[0]                : AIC=978.579, Time=0.06 sec
 ARIMA(3,0,2)(0,0,0)[0]                : AIC=inf, Time=0.60 sec
 ARIMA(2,0,1)(0,0,0)[0] intercept   : AIC=959.859, Time=0.64 sec
 ARIMA(1,0,1)(0,0,0)[0] intercept   : AIC=959.272, Time=0.13 sec
 ARIMA(0,0,1)(0,0,0)[0] intercept   : AIC=958.548, Time=0.07 sec
 ARIMA(0,0,0)(0,0,0)[0] intercept   : AIC=973.034, Time=0.02 sec
 ARIMA(0,0,2)(0,0,0)[0] intercept   : AIC=959.165, Time=0.10 sec
 ARIMA(1,0,0)(0,0,0)[0] intercept   : AIC=957.287, Time=0.07 sec
```

```
 ARIMA(2,0,0)(0,0,0)[0] intercept   : AIC=959.272, Time=0.10 sec

Best model:  ARIMA(1,0,0)(0,0,0)[0] intercept
Total fit time: 2.958 seconds
Performing stepwise search to minimize aic
 ARIMA(1,0,1)(0,0,0)[0]             : AIC=442.452, Time=0.10 sec
 ARIMA(0,0,0)(0,0,0)[0]             : AIC=524.531, Time=0.03 sec
```

/usr/local/lib/python3.10/dist-packages/statsmodels/tsa/base/
tsa_model.py:836: ValueWarning: No supported index is available.
Prediction results will be given with an integer index beginning at
`start`.
  return get_prediction_index(
/usr/local/lib/python3.10/dist-packages/statsmodels/tsa/base/tsa_model
.py:836: FutureWarning: No supported index is available. In the next
version, calling this method in a model without a supported index will
result in an exception.
  return get_prediction_index(

```
 ARIMA(1,0,0)(0,0,0)[0]             : AIC=468.926, Time=0.04 sec
 ARIMA(0,0,1)(0,0,0)[0]             : AIC=489.588, Time=0.03 sec
 ARIMA(2,0,1)(0,0,0)[0]             : AIC=442.372, Time=0.11 sec
 ARIMA(2,0,0)(0,0,0)[0]             : AIC=457.510, Time=0.05 sec
 ARIMA(3,0,1)(0,0,0)[0]             : AIC=444.056, Time=0.17 sec
 ARIMA(2,0,2)(0,0,0)[0]             : AIC=443.354, Time=0.18 sec
 ARIMA(1,0,2)(0,0,0)[0]             : AIC=442.610, Time=0.12 sec
 ARIMA(3,0,0)(0,0,0)[0]             : AIC=455.251, Time=0.06 sec
 ARIMA(3,0,2)(0,0,0)[0]             : AIC=444.776, Time=0.31 sec
 ARIMA(2,0,1)(0,0,0)[0] intercept   : AIC=440.796, Time=0.29 sec
 ARIMA(1,0,1)(0,0,0)[0] intercept   : AIC=439.993, Time=0.15 sec
 ARIMA(0,0,1)(0,0,0)[0] intercept   : AIC=456.373, Time=0.08 sec
 ARIMA(1,0,0)(0,0,0)[0] intercept   : AIC=449.212, Time=0.09 sec
 ARIMA(1,0,2)(0,0,0)[0] intercept   : AIC=440.902, Time=0.54 sec
 ARIMA(0,0,0)(0,0,0)[0] intercept   : AIC=473.536, Time=0.10 sec
 ARIMA(0,0,2)(0,0,0)[0] intercept   : AIC=450.250, Time=0.20 sec
 ARIMA(2,0,0)(0,0,0)[0] intercept   : AIC=445.183, Time=0.62 sec
 ARIMA(2,0,2)(0,0,0)[0] intercept   : AIC=441.237, Time=1.22 sec

Best model:  ARIMA(1,0,1)(0,0,0)[0] intercept
Total fit time: 4.546 seconds
Warning: Invalid prediction range for item B0BNKZ5SKF. Skipping
forecast.
Performing stepwise search to minimize aic
 ARIMA(1,0,1)(0,0,0)[0]             : AIC=757.447, Time=0.28 sec
 ARIMA(0,0,0)(0,0,0)[0]             : AIC=916.865, Time=0.04 sec
 ARIMA(1,0,0)(0,0,0)[0]             : AIC=792.269, Time=0.07 sec
 ARIMA(0,0,1)(0,0,0)[0]             : AIC=842.772, Time=0.34 sec
 ARIMA(2,0,1)(0,0,0)[0]             : AIC=758.864, Time=0.82 sec
 ARIMA(1,0,2)(0,0,0)[0]             : AIC=758.626, Time=0.07 sec
 ARIMA(0,0,2)(0,0,0)[0]             : AIC=828.101, Time=0.05 sec
```

```
 ARIMA(2,0,0)(0,0,0)[0]                 : AIC=769.246, Time=0.07 sec
 ARIMA(2,0,2)(0,0,0)[0]                 : AIC=757.231, Time=0.26 sec
 ARIMA(3,0,2)(0,0,0)[0]                 : AIC=751.491, Time=0.31 sec
 ARIMA(3,0,1)(0,0,0)[0]                 : AIC=750.048, Time=0.11 sec
 ARIMA(3,0,0)(0,0,0)[0]                 : AIC=752.834, Time=0.05 sec
 ARIMA(3,0,1)(0,0,0)[0] intercept       : AIC=750.576, Time=0.24 sec

Best model:  ARIMA(3,0,1)(0,0,0)[0]
Total fit time: 2.745 seconds
Performing stepwise search to minimize aic

/usr/local/lib/python3.10/dist-packages/statsmodels/tsa/base/
tsa_model.py:836: ValueWarning: No supported index is available.
Prediction results will be given with an integer index beginning at
`start`.
  return get_prediction_index(
/usr/local/lib/python3.10/dist-packages/statsmodels/tsa/base/tsa_model
.py:836: FutureWarning: No supported index is available. In the next
version, calling this method in a model without a supported index will
result in an exception.
  return get_prediction_index(

 ARIMA(1,1,1)(0,0,0)[0] intercept       : AIC=950.051, Time=0.25 sec
 ARIMA(0,1,0)(0,0,0)[0] intercept       : AIC=1138.370, Time=0.03 sec
 ARIMA(1,1,0)(0,0,0)[0] intercept       : AIC=1073.971, Time=0.07 sec
 ARIMA(0,1,1)(0,0,0)[0] intercept       : AIC=949.873, Time=0.16 sec
 ARIMA(0,1,0)(0,0,0)[0]                 : AIC=1136.370, Time=0.02 sec
 ARIMA(0,1,2)(0,0,0)[0] intercept       : AIC=inf, Time=0.41 sec
 ARIMA(1,1,2)(0,0,0)[0] intercept       : AIC=945.623, Time=0.43 sec
 ARIMA(2,1,2)(0,0,0)[0] intercept       : AIC=947.322, Time=0.43 sec
 ARIMA(1,1,3)(0,0,0)[0] intercept       : AIC=947.182, Time=0.50 sec
 ARIMA(0,1,3)(0,0,0)[0] intercept       : AIC=945.920, Time=0.24 sec
 ARIMA(2,1,1)(0,0,0)[0] intercept       : AIC=946.609, Time=0.28 sec
 ARIMA(2,1,3)(0,0,0)[0] intercept       : AIC=949.120, Time=0.89 sec
 ARIMA(1,1,2)(0,0,0)[0]                 : AIC=943.647, Time=0.17 sec
 ARIMA(0,1,2)(0,0,0)[0]                 : AIC=947.417, Time=0.20 sec
 ARIMA(1,1,1)(0,0,0)[0]                 : AIC=948.084, Time=0.13 sec
 ARIMA(2,1,2)(0,0,0)[0]                 : AIC=945.338, Time=0.20 sec
 ARIMA(1,1,3)(0,0,0)[0]                 : AIC=945.195, Time=0.24 sec
 ARIMA(0,1,1)(0,0,0)[0]                 : AIC=947.891, Time=0.09 sec
 ARIMA(0,1,3)(0,0,0)[0]                 : AIC=943.928, Time=0.09 sec
 ARIMA(2,1,1)(0,0,0)[0]                 : AIC=944.618, Time=0.12 sec
 ARIMA(2,1,3)(0,0,0)[0]                 : AIC=947.133, Time=0.38 sec

Best model:  ARIMA(1,1,2)(0,0,0)[0]
Total fit time: 5.385 seconds
Performing stepwise search to minimize aic
 ARIMA(1,0,1)(0,0,0)[0]                 : AIC=2013.181, Time=0.06 sec
 ARIMA(0,0,0)(0,0,0)[0]                 : AIC=2125.292, Time=0.02 sec
 ARIMA(1,0,0)(0,0,0)[0]                 : AIC=2025.784, Time=0.04 sec
```

```
/usr/local/lib/python3.10/dist-packages/statsmodels/tsa/base/
tsa_model.py:836: ValueWarning: No supported index is available.
Prediction results will be given with an integer index beginning at
`start`.
  return get_prediction_index(
/usr/local/lib/python3.10/dist-packages/statsmodels/tsa/base/tsa_model
.py:836: FutureWarning: No supported index is available. In the next
version, calling this method in a model without a supported index will
result in an exception.
  return get_prediction_index(

 ARIMA(0,0,1)(0,0,0)[0]                : AIC=2014.061, Time=0.06 sec
 ARIMA(2,0,1)(0,0,0)[0]                : AIC=2014.434, Time=0.14 sec
 ARIMA(1,0,2)(0,0,0)[0]                : AIC=2001.120, Time=0.21 sec
 ARIMA(0,0,2)(0,0,0)[0]                : AIC=2013.597, Time=0.06 sec
 ARIMA(2,0,2)(0,0,0)[0]                : AIC=2003.002, Time=0.51 sec
 ARIMA(1,0,3)(0,0,0)[0]                : AIC=2002.995, Time=0.42 sec
 ARIMA(0,0,3)(0,0,0)[0]                : AIC=2015.100, Time=0.08 sec
 ARIMA(2,0,3)(0,0,0)[0]                : AIC=2004.954, Time=0.55 sec
 ARIMA(1,0,2)(0,0,0)[0] intercept   : AIC=2000.450, Time=0.35 sec
 ARIMA(0,0,2)(0,0,0)[0] intercept   : AIC=2000.681, Time=0.14 sec
 ARIMA(1,0,1)(0,0,0)[0] intercept   : AIC=2000.662, Time=0.15 sec
 ARIMA(2,0,2)(0,0,0)[0] intercept   : AIC=2002.435, Time=0.40 sec
 ARIMA(1,0,3)(0,0,0)[0] intercept   : AIC=2002.431, Time=1.41 sec
 ARIMA(0,0,1)(0,0,0)[0] intercept   : AIC=1999.373, Time=0.59 sec
 ARIMA(0,0,0)(0,0,0)[0] intercept   : AIC=2097.520, Time=0.05 sec
 ARIMA(1,0,0)(0,0,0)[0] intercept   : AIC=2016.896, Time=0.11 sec

Best model:  ARIMA(0,0,1)(0,0,0)[0] intercept
Total fit time: 5.399 seconds

/usr/local/lib/python3.10/dist-packages/statsmodels/tsa/base/
tsa_model.py:836: ValueWarning: No supported index is available.
Prediction results will be given with an integer index beginning at
`start`.
  return get_prediction_index(
/usr/local/lib/python3.10/dist-packages/statsmodels/tsa/base/tsa_model
.py:836: FutureWarning: No supported index is available. In the next
version, calling this method in a model without a supported index will
result in an exception.
  return get_prediction_index(

Performing stepwise search to minimize aic
 ARIMA(1,0,1)(0,0,0)[0]                : AIC=2002.716, Time=0.39 sec
 ARIMA(0,0,0)(0,0,0)[0]                : AIC=2442.142, Time=0.05 sec
 ARIMA(1,0,0)(0,0,0)[0]                : AIC=2089.354, Time=0.05 sec
 ARIMA(0,0,1)(0,0,0)[0]                : AIC=2261.682, Time=0.22 sec
 ARIMA(2,0,1)(0,0,0)[0]                : AIC=1999.433, Time=1.39 sec
 ARIMA(2,0,0)(0,0,0)[0]                : AIC=2035.124, Time=0.11 sec
 ARIMA(3,0,1)(0,0,0)[0]                : AIC=2000.247, Time=0.24 sec
```

```
 ARIMA(2,0,2)(0,0,0)[0]                  : AIC=2001.069, Time=0.29 sec
 ARIMA(1,0,2)(0,0,0)[0]                  : AIC=2000.384, Time=0.14 sec
 ARIMA(3,0,0)(0,0,0)[0]                  : AIC=2032.191, Time=0.09 sec
 ARIMA(3,0,2)(0,0,0)[0]                  : AIC=2002.757, Time=0.60 sec
 ARIMA(2,0,1)(0,0,0)[0] intercept        : AIC=1995.775, Time=0.40 sec
 ARIMA(1,0,1)(0,0,0)[0] intercept        : AIC=1997.979, Time=0.23 sec
 ARIMA(2,0,0)(0,0,0)[0] intercept        : AIC=2015.929, Time=0.13 sec
 ARIMA(3,0,1)(0,0,0)[0] intercept        : AIC=1996.650, Time=0.75 sec
 ARIMA(2,0,2)(0,0,0)[0] intercept        : AIC=1997.446, Time=0.59 sec
 ARIMA(1,0,0)(0,0,0)[0] intercept        : AIC=2051.872, Time=0.10 sec
 ARIMA(1,0,2)(0,0,0)[0] intercept        : AIC=1996.563, Time=0.30 sec
 ARIMA(3,0,0)(0,0,0)[0] intercept        : AIC=2016.114, Time=0.19 sec
 ARIMA(3,0,2)(0,0,0)[0] intercept        : AIC=1999.115, Time=1.16 sec

Best model:  ARIMA(2,0,1)(0,0,0)[0] intercept
Total fit time: 7.453 seconds
Performing stepwise search to minimize aic

/usr/local/lib/python3.10/dist-packages/statsmodels/tsa/base/
tsa_model.py:836: ValueWarning: No supported index is available.
Prediction results will be given with an integer index beginning at
`start`.
  return get_prediction_index(
/usr/local/lib/python3.10/dist-packages/statsmodels/tsa/base/tsa_model
.py:836: FutureWarning: No supported index is available. In the next
version, calling this method in a model without a supported index will
result in an exception.
  return get_prediction_index(

 ARIMA(1,1,1)(0,0,0)[0] intercept        : AIC=1445.357, Time=0.43 sec
 ARIMA(0,1,0)(0,0,0)[0] intercept        : AIC=1529.273, Time=0.03 sec
 ARIMA(1,1,0)(0,0,0)[0] intercept        : AIC=1503.130, Time=0.07 sec
 ARIMA(0,1,1)(0,0,0)[0] intercept        : AIC=1446.280, Time=0.08 sec
 ARIMA(0,1,0)(0,0,0)[0]                  : AIC=1527.273, Time=0.03 sec
 ARIMA(2,1,1)(0,0,0)[0] intercept        : AIC=1425.975, Time=0.17 sec
 ARIMA(2,1,0)(0,0,0)[0] intercept        : AIC=1445.913, Time=0.10 sec
 ARIMA(3,1,1)(0,0,0)[0] intercept        : AIC=1423.749, Time=0.20 sec
 ARIMA(3,1,0)(0,0,0)[0] intercept        : AIC=1422.668, Time=0.10 sec
 ARIMA(3,1,0)(0,0,0)[0]                  : AIC=1420.668, Time=0.05 sec
 ARIMA(2,1,0)(0,0,0)[0]                  : AIC=1443.913, Time=0.06 sec
 ARIMA(3,1,1)(0,0,0)[0]                  : AIC=1421.749, Time=0.12 sec
 ARIMA(2,1,1)(0,0,0)[0]                  : AIC=1423.975, Time=0.11 sec

Best model:  ARIMA(3,1,0)(0,0,0)[0]
Total fit time: 1.591 seconds
Warning: Invalid prediction range for item B0BRDBKLVJ. Skipping
forecast.
Performing stepwise search to minimize aic
 ARIMA(1,1,1)(0,0,0)[0] intercept        : AIC=510.140, Time=0.12 sec
 ARIMA(0,1,0)(0,0,0)[0] intercept        : AIC=586.762, Time=0.02 sec
```

```
 ARIMA(1,1,0)(0,0,0)[0] intercept   : AIC=536.125, Time=0.06 sec
 ARIMA(0,1,1)(0,0,0)[0] intercept   : AIC=508.150, Time=0.09 sec
 ARIMA(0,1,0)(0,0,0)[0]             : AIC=584.762, Time=0.02 sec
 ARIMA(0,1,2)(0,0,0)[0] intercept   : AIC=510.141, Time=0.15 sec
 ARIMA(1,1,2)(0,0,0)[0] intercept   : AIC=510.202, Time=0.22 sec
 ARIMA(0,1,1)(0,0,0)[0]             : AIC=506.152, Time=0.05 sec
 ARIMA(1,1,1)(0,0,0)[0]             : AIC=508.142, Time=0.05 sec
 ARIMA(0,1,2)(0,0,0)[0]             : AIC=508.143, Time=0.05 sec
 ARIMA(1,1,0)(0,0,0)[0]             : AIC=534.126, Time=0.03 sec
 ARIMA(1,1,2)(0,0,0)[0]             : AIC=508.205, Time=0.14 sec

Best model:  ARIMA(0,1,1)(0,0,0)[0]
Total fit time: 1.024 seconds
Warning: Invalid prediction range for item B0BNL12NTT. Skipping
forecast.
Performing stepwise search to minimize aic
 ARIMA(1,1,1)(0,0,0)[0] intercept   : AIC=206.092, Time=0.19 sec
 ARIMA(0,1,0)(0,0,0)[0] intercept   : AIC=343.140, Time=0.05 sec
 ARIMA(1,1,0)(0,0,0)[0] intercept   : AIC=225.532, Time=0.07 sec
 ARIMA(0,1,1)(0,0,0)[0] intercept   : AIC=206.223, Time=0.16 sec
 ARIMA(0,1,0)(0,0,0)[0]             : AIC=341.140, Time=0.02 sec
 ARIMA(2,1,1)(0,0,0)[0] intercept   : AIC=inf, Time=0.46 sec
 ARIMA(1,1,2)(0,0,0)[0] intercept   : AIC=200.658, Time=0.31 sec
 ARIMA(0,1,2)(0,0,0)[0] intercept   : AIC=207.372, Time=0.21 sec
 ARIMA(2,1,2)(0,0,0)[0] intercept   : AIC=inf, Time=0.85 sec
 ARIMA(1,1,3)(0,0,0)[0] intercept   : AIC=192.842, Time=2.48 sec
 ARIMA(0,1,3)(0,0,0)[0] intercept   : AIC=193.104, Time=1.17 sec
 ARIMA(2,1,3)(0,0,0)[0] intercept   : AIC=194.346, Time=1.00 sec
 ARIMA(1,1,3)(0,0,0)[0]             : AIC=190.855, Time=0.23 sec
 ARIMA(0,1,3)(0,0,0)[0]             : AIC=191.161, Time=0.15 sec
 ARIMA(1,1,2)(0,0,0)[0]             : AIC=198.659, Time=0.13 sec
 ARIMA(2,1,3)(0,0,0)[0]             : AIC=192.348, Time=0.27 sec
 ARIMA(0,1,2)(0,0,0)[0]             : AIC=205.372, Time=0.08 sec
 ARIMA(2,1,2)(0,0,0)[0]             : AIC=189.599, Time=0.24 sec
 ARIMA(2,1,1)(0,0,0)[0]             : AIC=187.819, Time=0.20 sec
 ARIMA(1,1,1)(0,0,0)[0]             : AIC=204.093, Time=0.08 sec
 ARIMA(2,1,0)(0,0,0)[0]             : AIC=219.078, Time=0.07 sec
 ARIMA(3,1,1)(0,0,0)[0]             : AIC=189.639, Time=0.21 sec
 ARIMA(1,1,0)(0,0,0)[0]             : AIC=223.532, Time=0.04 sec
 ARIMA(3,1,0)(0,0,0)[0]             : AIC=212.144, Time=0.06 sec
 ARIMA(3,1,2)(0,0,0)[0]             : AIC=191.238, Time=0.55 sec

Best model:  ARIMA(2,1,1)(0,0,0)[0]
Total fit time: 9.314 seconds
Performing stepwise search to minimize aic
 ARIMA(1,0,1)(0,0,0)[0]             : AIC=143.662, Time=0.06 sec
 ARIMA(0,0,0)(0,0,0)[0]             : AIC=146.491, Time=0.03 sec
 ARIMA(1,0,0)(0,0,0)[0]             : AIC=141.665, Time=0.03 sec
```

```
/usr/local/lib/python3.10/dist-packages/statsmodels/tsa/base/
tsa_model.py:836: ValueWarning: No supported index is available.
Prediction results will be given with an integer index beginning at
`start`.
  return get_prediction_index(
/usr/local/lib/python3.10/dist-packages/statsmodels/tsa/base/tsa_model
.py:836: FutureWarning: No supported index is available. In the next
version, calling this method in a model without a supported index will
result in an exception.
  return get_prediction_index(

 ARIMA(0,0,1)(0,0,0)[0]               : AIC=141.916, Time=0.07 sec
 ARIMA(2,0,0)(0,0,0)[0]               : AIC=143.663, Time=0.04 sec
 ARIMA(2,0,1)(0,0,0)[0]               : AIC=145.660, Time=0.05 sec
 ARIMA(1,0,0)(0,0,0)[0] intercept     : AIC=131.835, Time=0.05 sec
 ARIMA(0,0,0)(0,0,0)[0] intercept     : AIC=131.858, Time=0.06 sec
 ARIMA(2,0,0)(0,0,0)[0] intercept     : AIC=132.735, Time=0.14 sec
 ARIMA(1,0,1)(0,0,0)[0] intercept     : AIC=133.402, Time=0.12 sec
 ARIMA(0,0,1)(0,0,0)[0] intercept     : AIC=131.515, Time=0.06 sec
 ARIMA(0,0,2)(0,0,0)[0] intercept     : AIC=133.225, Time=0.10 sec
 ARIMA(1,0,2)(0,0,0)[0] intercept     : AIC=135.045, Time=0.33 sec

Best model:  ARIMA(0,0,1)(0,0,0)[0] intercept
Total fit time: 1.176 seconds
Performing stepwise search to minimize aic
 ARIMA(1,0,1)(0,0,0)[0]               : AIC=321.754, Time=0.10 sec
 ARIMA(0,0,0)(0,0,0)[0]               : AIC=344.064, Time=0.02 sec
 ARIMA(1,0,0)(0,0,0)[0]               : AIC=336.042, Time=0.02 sec

/usr/local/lib/python3.10/dist-packages/statsmodels/tsa/base/
tsa_model.py:836: ValueWarning: No supported index is available.
Prediction results will be given with an integer index beginning at
`start`.
  return get_prediction_index(
/usr/local/lib/python3.10/dist-packages/statsmodels/tsa/base/tsa_model
.py:836: FutureWarning: No supported index is available. In the next
version, calling this method in a model without a supported index will
result in an exception.
  return get_prediction_index(

 ARIMA(0,0,1)(0,0,0)[0]               : AIC=339.165, Time=0.05 sec
 ARIMA(2,0,1)(0,0,0)[0]               : AIC=323.716, Time=0.10 sec
 ARIMA(1,0,2)(0,0,0)[0]               : AIC=323.721, Time=0.10 sec
 ARIMA(0,0,2)(0,0,0)[0]               : AIC=335.617, Time=0.05 sec
 ARIMA(2,0,0)(0,0,0)[0]               : AIC=330.253, Time=0.05 sec
 ARIMA(2,0,2)(0,0,0)[0]               : AIC=325.649, Time=0.17 sec
 ARIMA(1,0,1)(0,0,0)[0] intercept     : AIC=318.865, Time=0.15 sec
 ARIMA(0,0,1)(0,0,0)[0] intercept     : AIC=319.555, Time=0.05 sec
 ARIMA(1,0,0)(0,0,0)[0] intercept     : AIC=319.244, Time=0.05 sec
 ARIMA(2,0,1)(0,0,0)[0] intercept     : AIC=320.391, Time=0.14 sec
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 ARIMA(1,0,2)(0,0,0)[0] intercept   : AIC=320.306, Time=0.15 sec
 ARIMA(0,0,0)(0,0,0)[0] intercept   : AIC=318.860, Time=0.04 sec

Best model:  ARIMA(0,0,0)(0,0,0)[0] intercept
Total fit time: 1.263 seconds
Performing stepwise search to minimize aic
 ARIMA(1,0,1)(0,0,0)[0]             : AIC=2148.688, Time=0.05 sec
 ARIMA(0,0,0)(0,0,0)[0]             : AIC=2469.618, Time=0.02 sec
 ARIMA(1,0,0)(0,0,0)[0]             : AIC=2146.753, Time=0.04 sec

/usr/local/lib/python3.10/dist-packages/statsmodels/tsa/base/
tsa_model.py:836: ValueWarning: No supported index is available.
Prediction results will be given with an integer index beginning at
`start`.
  return get_prediction_index(
/usr/local/lib/python3.10/dist-packages/statsmodels/tsa/base/tsa_model
.py:836: FutureWarning: No supported index is available. In the next
version, calling this method in a model without a supported index will
result in an exception.
  return get_prediction_index(

 ARIMA(0,0,1)(0,0,0)[0]             : AIC=2272.759, Time=0.06 sec
 ARIMA(2,0,0)(0,0,0)[0]             : AIC=2148.694, Time=0.06 sec
 ARIMA(2,0,1)(0,0,0)[0]             : AIC=2149.946, Time=0.28 sec
 ARIMA(1,0,0)(0,0,0)[0] intercept   : AIC=2143.066, Time=0.08 sec
 ARIMA(0,0,0)(0,0,0)[0] intercept   : AIC=2426.673, Time=0.02 sec
 ARIMA(2,0,0)(0,0,0)[0] intercept   : AIC=2144.747, Time=0.13 sec
 ARIMA(1,0,1)(0,0,0)[0] intercept   : AIC=2144.733, Time=0.12 sec
 ARIMA(0,0,1)(0,0,0)[0] intercept   : AIC=2244.922, Time=0.12 sec
 ARIMA(2,0,1)(0,0,0)[0] intercept   : AIC=2146.720, Time=0.48 sec

Best model:  ARIMA(1,0,0)(0,0,0)[0] intercept
Total fit time: 1.480 seconds
Warning: Invalid prediction range for item B0BRDBKB4D. Skipping
forecast.
Performing stepwise search to minimize aic
 ARIMA(1,1,1)(0,0,0)[0] intercept   : AIC=inf, Time=0.49 sec
 ARIMA(0,1,0)(0,0,0)[0] intercept   : AIC=455.405, Time=0.06 sec
 ARIMA(1,1,0)(0,0,0)[0] intercept   : AIC=412.520, Time=0.05 sec
 ARIMA(0,1,1)(0,0,0)[0] intercept   : AIC=inf, Time=0.30 sec
 ARIMA(0,1,0)(0,0,0)[0]             : AIC=453.405, Time=0.02 sec
 ARIMA(2,1,0)(0,0,0)[0] intercept   : AIC=389.302, Time=0.07 sec
 ARIMA(3,1,0)(0,0,0)[0] intercept   : AIC=375.847, Time=0.11 sec
 ARIMA(3,1,1)(0,0,0)[0] intercept   : AIC=inf, Time=0.50 sec
 ARIMA(2,1,1)(0,0,0)[0] intercept   : AIC=inf, Time=0.51 sec
 ARIMA(3,1,0)(0,0,0)[0]             : AIC=373.851, Time=0.05 sec
 ARIMA(2,1,0)(0,0,0)[0]             : AIC=387.304, Time=0.03 sec
 ARIMA(3,1,1)(0,0,0)[0]             : AIC=345.633, Time=0.16 sec
 ARIMA(2,1,1)(0,0,0)[0]             : AIC=343.643, Time=0.11 sec
 ARIMA(1,1,1)(0,0,0)[0]             : AIC=342.111, Time=0.10 sec
```

```
 ARIMA(0,1,1)(0,0,0)[0]                : AIC=340.339, Time=0.06 sec
 ARIMA(0,1,2)(0,0,0)[0]                : AIC=342.085, Time=0.10 sec
 ARIMA(1,1,0)(0,0,0)[0]                : AIC=410.520, Time=0.03 sec
 ARIMA(1,1,2)(0,0,0)[0]                : AIC=343.926, Time=0.23 sec

Best model:  ARIMA(0,1,1)(0,0,0)[0]
Total fit time: 3.015 seconds
Warning: Invalid prediction range for item B0BNL4RPB5. Skipping
forecast.
Performing stepwise search to minimize aic
 ARIMA(1,1,1)(0,0,0)[0] intercept   : AIC=inf, Time=1.89 sec
 ARIMA(0,1,0)(0,0,0)[0] intercept   : AIC=484.946, Time=0.11 sec
 ARIMA(1,1,0)(0,0,0)[0] intercept   : AIC=457.632, Time=0.05 sec
 ARIMA(0,1,1)(0,0,0)[0] intercept   : AIC=402.520, Time=0.35 sec
 ARIMA(0,1,0)(0,0,0)[0]             : AIC=482.946, Time=0.04 sec
 ARIMA(0,1,2)(0,0,0)[0] intercept   : AIC=inf, Time=1.78 sec
 ARIMA(1,1,2)(0,0,0)[0] intercept   : AIC=394.257, Time=0.32 sec
 ARIMA(2,1,2)(0,0,0)[0] intercept   : AIC=396.093, Time=0.58 sec
 ARIMA(1,1,3)(0,0,0)[0] intercept   : AIC=inf, Time=0.73 sec
 ARIMA(0,1,3)(0,0,0)[0] intercept   : AIC=400.736, Time=0.22 sec
 ARIMA(2,1,1)(0,0,0)[0] intercept   : AIC=402.929, Time=0.26 sec
 ARIMA(2,1,3)(0,0,0)[0] intercept   : AIC=392.677, Time=0.58 sec
 ARIMA(3,1,3)(0,0,0)[0] intercept   : AIC=inf, Time=0.83 sec
 ARIMA(3,1,2)(0,0,0)[0] intercept   : AIC=inf, Time=0.62 sec
 ARIMA(2,1,3)(0,0,0)[0]             : AIC=390.824, Time=0.29 sec
 ARIMA(1,1,3)(0,0,0)[0]             : AIC=394.337, Time=0.25 sec
 ARIMA(2,1,2)(0,0,0)[0]             : AIC=394.256, Time=0.21 sec
 ARIMA(3,1,3)(0,0,0)[0]             : AIC=392.241, Time=0.36 sec
 ARIMA(1,1,2)(0,0,0)[0]             : AIC=392.531, Time=0.21 sec
 ARIMA(3,1,2)(0,0,0)[0]             : AIC=394.475, Time=0.31 sec

Best model:  ARIMA(2,1,3)(0,0,0)[0]
Total fit time: 10.022 seconds
Performing stepwise search to minimize aic
 ARIMA(1,0,1)(0,0,0)[0]                : AIC=1222.836, Time=0.07 sec
 ARIMA(0,0,0)(0,0,0)[0]                : AIC=1470.547, Time=0.02 sec
 ARIMA(1,0,0)(0,0,0)[0]                : AIC=1293.629, Time=0.04 sec

/usr/local/lib/python3.10/dist-packages/statsmodels/tsa/base/
tsa_model.py:836: ValueWarning: No supported index is available.
Prediction results will be given with an integer index beginning at
`start`.
  return get_prediction_index(
/usr/local/lib/python3.10/dist-packages/statsmodels/tsa/base/tsa_model
.py:836: FutureWarning: No supported index is available. In the next
version, calling this method in a model without a supported index will
result in an exception.
  return get_prediction_index(
```

```
 ARIMA(0,0,1)(0,0,0)[0]                : AIC=1378.557, Time=0.06 sec
 ARIMA(2,0,1)(0,0,0)[0]                : AIC=1222.834, Time=0.09 sec
 ARIMA(2,0,0)(0,0,0)[0]                : AIC=1237.158, Time=0.05 sec
 ARIMA(3,0,1)(0,0,0)[0]                : AIC=1224.740, Time=0.17 sec
 ARIMA(2,0,2)(0,0,0)[0]                : AIC=1221.484, Time=0.33 sec
 ARIMA(1,0,2)(0,0,0)[0]                : AIC=1222.926, Time=0.10 sec
 ARIMA(3,0,2)(0,0,0)[0]                : AIC=1223.262, Time=0.44 sec
 ARIMA(2,0,3)(0,0,0)[0]                : AIC=1223.236, Time=0.45 sec
 ARIMA(1,0,3)(0,0,0)[0]                : AIC=1224.883, Time=0.13 sec
 ARIMA(3,0,3)(0,0,0)[0]                : AIC=inf, Time=0.79 sec
 ARIMA(2,0,2)(0,0,0)[0] intercept   : AIC=1215.719, Time=0.57 sec
 ARIMA(1,0,2)(0,0,0)[0] intercept   : AIC=1216.608, Time=0.24 sec
 ARIMA(2,0,1)(0,0,0)[0] intercept   : AIC=1216.595, Time=0.22 sec
 ARIMA(3,0,2)(0,0,0)[0] intercept   : AIC=1217.224, Time=2.63 sec
 ARIMA(2,0,3)(0,0,0)[0] intercept   : AIC=1217.134, Time=2.08 sec
 ARIMA(1,0,1)(0,0,0)[0] intercept   : AIC=1217.325, Time=0.21 sec
 ARIMA(1,0,3)(0,0,0)[0] intercept   : AIC=1218.595, Time=0.29 sec
 ARIMA(3,0,1)(0,0,0)[0] intercept   : AIC=1218.582, Time=0.32 sec
 ARIMA(3,0,3)(0,0,0)[0] intercept   : AIC=1217.402, Time=1.24 sec

Best model:  ARIMA(2,0,2)(0,0,0)[0] intercept
Total fit time: 10.592 seconds
Performing stepwise search to minimize aic
 ARIMA(1,0,1)(0,0,0)[0]                : AIC=596.447, Time=0.08 sec
 ARIMA(0,0,0)(0,0,0)[0]                : AIC=695.179, Time=0.03 sec
 ARIMA(1,0,0)(0,0,0)[0]                : AIC=618.036, Time=0.03 sec
```

/usr/local/lib/python3.10/dist-packages/statsmodels/tsa/base/
tsa_model.py:836: ValueWarning: No supported index is available.
Prediction results will be given with an integer index beginning at
`start`.
  return get_prediction_index(
/usr/local/lib/python3.10/dist-packages/statsmodels/tsa/base/tsa_model
.py:836: FutureWarning: No supported index is available. In the next
version, calling this method in a model without a supported index will
result in an exception.
  return get_prediction_index(

```
 ARIMA(0,0,1)(0,0,0)[0]                : AIC=639.225, Time=0.06 sec
 ARIMA(2,0,1)(0,0,0)[0]                : AIC=594.657, Time=0.17 sec
 ARIMA(2,0,0)(0,0,0)[0]                : AIC=613.077, Time=0.07 sec
 ARIMA(3,0,1)(0,0,0)[0]                : AIC=595.164, Time=0.15 sec
 ARIMA(2,0,2)(0,0,0)[0]                : AIC=594.308, Time=0.18 sec
 ARIMA(1,0,2)(0,0,0)[0]                : AIC=593.796, Time=0.14 sec
 ARIMA(0,0,2)(0,0,0)[0]                : AIC=632.691, Time=0.05 sec
 ARIMA(1,0,3)(0,0,0)[0]                : AIC=594.665, Time=0.12 sec
 ARIMA(0,0,3)(0,0,0)[0]                : AIC=622.461, Time=0.07 sec
 ARIMA(2,0,3)(0,0,0)[0]                : AIC=596.307, Time=0.22 sec
 ARIMA(1,0,2)(0,0,0)[0] intercept   : AIC=592.158, Time=0.33 sec
 ARIMA(0,0,2)(0,0,0)[0] intercept   : AIC=611.526, Time=0.11 sec
```

```
 ARIMA(1,0,1)(0,0,0)[0] intercept   : AIC=593.817, Time=0.19 sec
 ARIMA(2,0,2)(0,0,0)[0] intercept   : AIC=592.431, Time=0.31 sec
 ARIMA(1,0,3)(0,0,0)[0] intercept   : AIC=592.494, Time=0.33 sec
 ARIMA(0,0,1)(0,0,0)[0] intercept   : AIC=613.605, Time=0.08 sec
 ARIMA(0,0,3)(0,0,0)[0] intercept   : AIC=605.592, Time=0.14 sec
 ARIMA(2,0,1)(0,0,0)[0] intercept   : AIC=592.992, Time=0.34 sec
 ARIMA(2,0,3)(0,0,0)[0] intercept   : AIC=594.376, Time=0.49 sec

Best model:  ARIMA(1,0,2)(0,0,0)[0] intercept
Total fit time: 3.748 seconds
Performing stepwise search to minimize aic

/usr/local/lib/python3.10/dist-packages/statsmodels/tsa/base/
tsa_model.py:836: ValueWarning: No supported index is available.
Prediction results will be given with an integer index beginning at
`start`.
  return get_prediction_index(
/usr/local/lib/python3.10/dist-packages/statsmodels/tsa/base/tsa_model
.py:836: FutureWarning: No supported index is available. In the next
version, calling this method in a model without a supported index will
result in an exception.
  return get_prediction_index(

 ARIMA(1,1,1)(0,0,0)[0] intercept   : AIC=1538.406, Time=0.17 sec
 ARIMA(0,1,0)(0,0,0)[0] intercept   : AIC=1574.040, Time=0.03 sec
 ARIMA(1,1,0)(0,0,0)[0] intercept   : AIC=1573.774, Time=0.07 sec
 ARIMA(0,1,1)(0,0,0)[0] intercept   : AIC=1571.387, Time=0.08 sec
 ARIMA(0,1,0)(0,0,0)[0]             : AIC=1572.040, Time=0.02 sec
 ARIMA(2,1,1)(0,0,0)[0] intercept   : AIC=1531.936, Time=0.17 sec
 ARIMA(2,1,0)(0,0,0)[0] intercept   : AIC=1560.126, Time=0.09 sec
 ARIMA(3,1,1)(0,0,0)[0] intercept   : AIC=1533.636, Time=0.30 sec
 ARIMA(2,1,2)(0,0,0)[0] intercept   : AIC=1534.275, Time=0.30 sec
 ARIMA(1,1,2)(0,0,0)[0] intercept   : AIC=1532.400, Time=0.21 sec
 ARIMA(3,1,0)(0,0,0)[0] intercept   : AIC=1557.678, Time=0.15 sec
 ARIMA(3,1,2)(0,0,0)[0] intercept   : AIC=1533.148, Time=0.51 sec
 ARIMA(2,1,1)(0,0,0)[0]             : AIC=1529.936, Time=0.09 sec
 ARIMA(1,1,1)(0,0,0)[0]             : AIC=1536.406, Time=0.07 sec
 ARIMA(2,1,0)(0,0,0)[0]             : AIC=1558.126, Time=0.05 sec
 ARIMA(3,1,1)(0,0,0)[0]             : AIC=1531.636, Time=0.17 sec
 ARIMA(2,1,2)(0,0,0)[0]             : AIC=1532.275, Time=0.17 sec
 ARIMA(1,1,0)(0,0,0)[0]             : AIC=1571.774, Time=0.04 sec
 ARIMA(1,1,2)(0,0,0)[0]             : AIC=1530.400, Time=0.09 sec
 ARIMA(3,1,0)(0,0,0)[0]             : AIC=1555.678, Time=0.10 sec
 ARIMA(3,1,2)(0,0,0)[0]             : AIC=1531.148, Time=0.33 sec

Best model:  ARIMA(2,1,1)(0,0,0)[0]
Total fit time: 3.249 seconds
Warning: Invalid prediction range for item B0BNKYPGZQ. Skipping
forecast.
Performing stepwise search to minimize aic
```

```
 ARIMA(1,0,1)(0,0,0)[0]                    : AIC=377.459, Time=0.10 sec
 ARIMA(0,0,0)(0,0,0)[0]                    : AIC=420.131, Time=0.04 sec
 ARIMA(1,0,0)(0,0,0)[0]                    : AIC=396.469, Time=0.04 sec
 ARIMA(0,0,1)(0,0,0)[0]                    : AIC=404.489, Time=0.04 sec
 ARIMA(2,0,1)(0,0,0)[0]                    : AIC=378.255, Time=0.13 sec
 ARIMA(1,0,2)(0,0,0)[0]                    : AIC=378.501, Time=0.14 sec
 ARIMA(0,0,2)(0,0,0)[0]                    : AIC=395.500, Time=0.06 sec
 ARIMA(2,0,0)(0,0,0)[0]                    : AIC=387.297, Time=0.04 sec
 ARIMA(2,0,2)(0,0,0)[0]                    : AIC=381.276, Time=1.92 sec
 ARIMA(1,0,1)(0,0,0)[0] intercept   : AIC=372.854, Time=0.52 sec
 ARIMA(0,0,1)(0,0,0)[0] intercept   : AIC=378.876, Time=0.25 sec
 ARIMA(1,0,0)(0,0,0)[0] intercept   : AIC=376.602, Time=0.11 sec
 ARIMA(2,0,1)(0,0,0)[0] intercept   : AIC=374.852, Time=1.32 sec
 ARIMA(1,0,2)(0,0,0)[0] intercept   : AIC=374.853, Time=0.49 sec
 ARIMA(0,0,0)(0,0,0)[0] intercept   : AIC=384.637, Time=0.05 sec
 ARIMA(0,0,2)(0,0,0)[0] intercept   : AIC=375.736, Time=0.09 sec
 ARIMA(2,0,0)(0,0,0)[0] intercept   : AIC=374.027, Time=0.09 sec
 ARIMA(2,0,2)(0,0,0)[0] intercept   : AIC=376.766, Time=0.46 sec

Best model:  ARIMA(1,0,1)(0,0,0)[0] intercept
Total fit time: 5.906 seconds
Warning: Invalid prediction range for item B0BNKZFZVL. Skipping
forecast.
Performing stepwise search to minimize aic
 ARIMA(1,0,1)(0,0,0)[0]                    : AIC=288.190, Time=0.07 sec
 ARIMA(0,0,0)(0,0,0)[0]                    : AIC=340.165, Time=0.03 sec
 ARIMA(1,0,0)(0,0,0)[0]                    : AIC=302.768, Time=0.03 sec
 ARIMA(0,0,1)(0,0,0)[0]                    : AIC=312.142, Time=0.05 sec
 ARIMA(2,0,1)(0,0,0)[0]                    : AIC=288.375, Time=0.12 sec
 ARIMA(1,0,2)(0,0,0)[0]                    : AIC=288.097, Time=0.08 sec
 ARIMA(0,0,2)(0,0,0)[0]                    : AIC=310.647, Time=0.05 sec
 ARIMA(2,0,2)(0,0,0)[0]                    : AIC=inf, Time=0.25 sec
 ARIMA(1,0,3)(0,0,0)[0]                    : AIC=289.626, Time=0.13 sec
 ARIMA(0,0,3)(0,0,0)[0]                    : AIC=301.301, Time=0.06 sec
 ARIMA(2,0,3)(0,0,0)[0]                    : AIC=291.141, Time=0.23 sec
 ARIMA(1,0,2)(0,0,0)[0] intercept   : AIC=286.636, Time=0.23 sec
 ARIMA(0,0,2)(0,0,0)[0] intercept   : AIC=295.462, Time=0.12 sec
 ARIMA(1,0,1)(0,0,0)[0] intercept   : AIC=285.847, Time=0.15 sec
 ARIMA(0,0,1)(0,0,0)[0] intercept   : AIC=294.773, Time=0.06 sec
 ARIMA(1,0,0)(0,0,0)[0] intercept   : AIC=291.202, Time=0.06 sec
 ARIMA(2,0,1)(0,0,0)[0] intercept   : AIC=286.881, Time=0.30 sec
 ARIMA(0,0,0)(0,0,0)[0] intercept   : AIC=311.220, Time=0.06 sec
 ARIMA(2,0,0)(0,0,0)[0] intercept   : AIC=291.066, Time=0.15 sec
 ARIMA(2,0,2)(0,0,0)[0] intercept   : AIC=inf, Time=0.46 sec

Best model:  ARIMA(1,0,1)(0,0,0)[0] intercept
Total fit time: 2.713 seconds
Performing stepwise search to minimize aic
 ARIMA(1,0,1)(0,0,0)[0]                    : AIC=1055.083, Time=0.09 sec
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 ARIMA(0,0,0)(0,0,0)[0]                    : AIC=1216.613, Time=0.02 sec
 ARIMA(1,0,0)(0,0,0)[0]                    : AIC=1097.456, Time=0.03 sec

/usr/local/lib/python3.10/dist-packages/statsmodels/tsa/base/
tsa_model.py:836: ValueWarning: No supported index is available.
Prediction results will be given with an integer index beginning at
`start`.
  return get_prediction_index(
/usr/local/lib/python3.10/dist-packages/statsmodels/tsa/base/tsa_model
.py:836: FutureWarning: No supported index is available. In the next
version, calling this method in a model without a supported index will
result in an exception.
  return get_prediction_index(

 ARIMA(0,0,1)(0,0,0)[0]                    : AIC=1146.160, Time=0.05 sec
 ARIMA(2,0,1)(0,0,0)[0]                    : AIC=1056.859, Time=0.23 sec
 ARIMA(1,0,2)(0,0,0)[0]                    : AIC=1056.840, Time=0.10 sec
 ARIMA(0,0,2)(0,0,0)[0]                    : AIC=1122.801, Time=0.05 sec
 ARIMA(2,0,0)(0,0,0)[0]                    : AIC=1074.775, Time=0.05 sec
 ARIMA(2,0,2)(0,0,0)[0]                    : AIC=1058.745, Time=0.26 sec
 ARIMA(1,0,1)(0,0,0)[0] intercept   : AIC=1049.984, Time=0.16 sec
 ARIMA(0,0,1)(0,0,0)[0] intercept   : AIC=1091.482, Time=0.10 sec
 ARIMA(1,0,0)(0,0,0)[0] intercept   : AIC=1071.524, Time=0.08 sec
 ARIMA(2,0,1)(0,0,0)[0] intercept   : AIC=1051.968, Time=0.22 sec
 ARIMA(1,0,2)(0,0,0)[0] intercept   : AIC=1051.965, Time=0.20 sec
 ARIMA(0,0,0)(0,0,0)[0] intercept   : AIC=1131.631, Time=0.02 sec
 ARIMA(0,0,2)(0,0,0)[0] intercept   : AIC=1080.562, Time=0.12 sec
 ARIMA(2,0,0)(0,0,0)[0] intercept   : AIC=1059.958, Time=0.09 sec
 ARIMA(2,0,2)(0,0,0)[0] intercept   : AIC=1053.871, Time=0.49 sec

Best model:  ARIMA(1,0,1)(0,0,0)[0] intercept
Total fit time: 2.405 seconds
Warning: Invalid prediction range for item B0BNKZH2FW. Skipping
forecast.
Performing stepwise search to minimize aic
 ARIMA(1,0,1)(0,0,0)[0]                    : AIC=727.932, Time=0.07 sec
 ARIMA(0,0,0)(0,0,0)[0]                    : AIC=744.233, Time=0.01 sec
 ARIMA(1,0,0)(0,0,0)[0]                    : AIC=729.113, Time=0.03 sec
 ARIMA(0,0,1)(0,0,0)[0]                    : AIC=731.867, Time=0.03 sec
 ARIMA(2,0,1)(0,0,0)[0]                    : AIC=inf, Time=0.31 sec
 ARIMA(1,0,2)(0,0,0)[0]                    : AIC=inf, Time=0.29 sec
 ARIMA(0,0,2)(0,0,0)[0]                    : AIC=731.339, Time=0.04 sec
 ARIMA(2,0,0)(0,0,0)[0]                    : AIC=729.579, Time=0.04 sec
 ARIMA(2,0,2)(0,0,0)[0]                    : AIC=inf, Time=0.51 sec
 ARIMA(1,0,1)(0,0,0)[0] intercept   : AIC=719.402, Time=0.14 sec
 ARIMA(0,0,1)(0,0,0)[0] intercept   : AIC=718.243, Time=0.07 sec
 ARIMA(0,0,0)(0,0,0)[0] intercept   : AIC=724.565, Time=0.02 sec
 ARIMA(0,0,2)(0,0,0)[0] intercept   : AIC=719.627, Time=0.08 sec
 ARIMA(1,0,0)(0,0,0)[0] intercept   : AIC=717.591, Time=0.05 sec
 ARIMA(2,0,0)(0,0,0)[0] intercept   : AIC=719.437, Time=0.08 sec
```

```
 ARIMA(2,0,1)(0,0,0)[0] intercept   : AIC=721.363, Time=0.25 sec

Best model:  ARIMA(1,0,0)(0,0,0)[0] intercept
Total fit time: 2.055 seconds
Performing stepwise search to minimize aic
 ARIMA(1,0,1)(0,0,0)[0]              : AIC=839.626, Time=0.06 sec
 ARIMA(0,0,0)(0,0,0)[0]              : AIC=917.351, Time=0.02 sec
 ARIMA(1,0,0)(0,0,0)[0]              : AIC=838.368, Time=0.03 sec
 ARIMA(0,0,1)(0,0,0)[0]              : AIC=843.459, Time=0.03 sec

/usr/local/lib/python3.10/dist-packages/statsmodels/tsa/base/
tsa_model.py:836: ValueWarning: No supported index is available.
Prediction results will be given with an integer index beginning at
`start`.
  return get_prediction_index(
/usr/local/lib/python3.10/dist-packages/statsmodels/tsa/base/tsa_model
.py:836: FutureWarning: No supported index is available. In the next
version, calling this method in a model without a supported index will
result in an exception.
  return get_prediction_index(

 ARIMA(2,0,0)(0,0,0)[0]              : AIC=839.996, Time=0.05 sec
 ARIMA(2,0,1)(0,0,0)[0]              : AIC=837.605, Time=0.12 sec
 ARIMA(3,0,1)(0,0,0)[0]              : AIC=837.152, Time=0.12 sec
 ARIMA(3,0,0)(0,0,0)[0]              : AIC=837.523, Time=0.05 sec
 ARIMA(3,0,2)(0,0,0)[0]              : AIC=823.484, Time=0.47 sec
 ARIMA(2,0,2)(0,0,0)[0]              : AIC=822.403, Time=0.24 sec
 ARIMA(1,0,2)(0,0,0)[0]              : AIC=820.626, Time=0.43 sec
 ARIMA(0,0,2)(0,0,0)[0]              : AIC=843.285, Time=0.26 sec
 ARIMA(1,0,3)(0,0,0)[0]              : AIC=822.472, Time=1.25 sec
 ARIMA(0,0,3)(0,0,0)[0]              : AIC=836.967, Time=0.14 sec
 ARIMA(2,0,3)(0,0,0)[0]              : AIC=823.954, Time=1.08 sec
 ARIMA(1,0,2)(0,0,0)[0] intercept   : AIC=820.608, Time=1.45 sec
 ARIMA(0,0,2)(0,0,0)[0] intercept   : AIC=824.648, Time=0.10 sec
 ARIMA(1,0,1)(0,0,0)[0] intercept   : AIC=824.422, Time=0.12 sec
 ARIMA(2,0,2)(0,0,0)[0] intercept   : AIC=822.326, Time=0.50 sec
 ARIMA(1,0,3)(0,0,0)[0] intercept   : AIC=822.412, Time=0.52 sec
 ARIMA(0,0,1)(0,0,0)[0] intercept   : AIC=822.878, Time=0.11 sec
 ARIMA(0,0,3)(0,0,0)[0] intercept   : AIC=823.207, Time=0.17 sec
 ARIMA(2,0,1)(0,0,0)[0] intercept   : AIC=823.751, Time=0.23 sec
 ARIMA(2,0,3)(0,0,0)[0] intercept   : AIC=823.886, Time=0.63 sec

Best model:  ARIMA(1,0,2)(0,0,0)[0] intercept
Total fit time: 8.248 seconds
Performing stepwise search to minimize aic
 ARIMA(1,0,1)(0,0,0)[0]              : AIC=1097.899, Time=0.08 sec
 ARIMA(0,0,0)(0,0,0)[0]              : AIC=1215.024, Time=0.02 sec
 ARIMA(1,0,0)(0,0,0)[0]              : AIC=1108.350, Time=0.03 sec
```

```
/usr/local/lib/python3.10/dist-packages/statsmodels/tsa/base/
tsa_model.py:836: ValueWarning: No supported index is available.
Prediction results will be given with an integer index beginning at
`start`.
  return get_prediction_index(
/usr/local/lib/python3.10/dist-packages/statsmodels/tsa/base/tsa_model
.py:836: FutureWarning: No supported index is available. In the next
version, calling this method in a model without a supported index will
result in an exception.
  return get_prediction_index(

 ARIMA(0,0,1)(0,0,0)[0]                  : AIC=1143.065, Time=0.05 sec
 ARIMA(2,0,1)(0,0,0)[0]                  : AIC=1094.899, Time=0.12 sec
 ARIMA(2,0,0)(0,0,0)[0]                  : AIC=1103.258, Time=0.05 sec
 ARIMA(3,0,1)(0,0,0)[0]                  : AIC=1096.632, Time=0.21 sec
 ARIMA(2,0,2)(0,0,0)[0]                  : AIC=1096.485, Time=0.23 sec
 ARIMA(1,0,2)(0,0,0)[0]                  : AIC=1096.011, Time=0.11 sec
 ARIMA(3,0,0)(0,0,0)[0]                  : AIC=1100.744, Time=0.07 sec
 ARIMA(3,0,2)(0,0,0)[0]                  : AIC=1098.712, Time=0.31 sec
 ARIMA(2,0,1)(0,0,0)[0] intercept        : AIC=1091.094, Time=0.24 sec
 ARIMA(1,0,1)(0,0,0)[0] intercept        : AIC=1090.552, Time=0.13 sec
 ARIMA(0,0,1)(0,0,0)[0] intercept        : AIC=1112.794, Time=0.09 sec
 ARIMA(1,0,0)(0,0,0)[0] intercept        : AIC=1093.712, Time=0.06 sec
 ARIMA(1,0,2)(0,0,0)[0] intercept        : AIC=1091.001, Time=0.21 sec
 ARIMA(0,0,0)(0,0,0)[0] intercept        : AIC=1166.361, Time=0.02 sec
 ARIMA(0,0,2)(0,0,0)[0] intercept        : AIC=1101.424, Time=0.15 sec
 ARIMA(2,0,0)(0,0,0)[0] intercept        : AIC=1092.388, Time=0.12 sec
 ARIMA(2,0,2)(0,0,0)[0] intercept        : AIC=1092.993, Time=0.39 sec

Best model:  ARIMA(1,0,1)(0,0,0)[0] intercept
Total fit time: 2.726 seconds
Performing stepwise search to minimize aic

/usr/local/lib/python3.10/dist-packages/statsmodels/tsa/base/
tsa_model.py:836: ValueWarning: No supported index is available.
Prediction results will be given with an integer index beginning at
`start`.
  return get_prediction_index(
/usr/local/lib/python3.10/dist-packages/statsmodels/tsa/base/tsa_model
.py:836: FutureWarning: No supported index is available. In the next
version, calling this method in a model without a supported index will
result in an exception.
  return get_prediction_index(

 ARIMA(1,1,1)(0,0,0)[0] intercept        : AIC=3478.588, Time=0.29 sec
 ARIMA(0,1,0)(0,0,0)[0] intercept        : AIC=3680.762, Time=0.03 sec
 ARIMA(1,1,0)(0,0,0)[0] intercept        : AIC=3591.697, Time=0.10 sec
 ARIMA(0,1,1)(0,0,0)[0] intercept        : AIC=3489.295, Time=0.16 sec
 ARIMA(0,1,0)(0,0,0)[0]                  : AIC=3678.762, Time=0.03 sec
 ARIMA(2,1,1)(0,0,0)[0] intercept        : AIC=3479.812, Time=0.37 sec
```

```
 ARIMA(1,1,2)(0,0,0)[0] intercept   : AIC=3477.708, Time=0.64 sec
 ARIMA(0,1,2)(0,0,0)[0] intercept   : AIC=3479.847, Time=0.25 sec
 ARIMA(2,1,2)(0,0,0)[0] intercept   : AIC=3479.730, Time=1.07 sec
 ARIMA(1,1,3)(0,0,0)[0] intercept   : AIC=3477.093, Time=1.17 sec
 ARIMA(0,1,3)(0,0,0)[0] intercept   : AIC=3481.067, Time=0.31 sec
 ARIMA(2,1,3)(0,0,0)[0] intercept   : AIC=3477.589, Time=4.72 sec
 ARIMA(1,1,3)(0,0,0)[0]             : AIC=3475.094, Time=0.54 sec
 ARIMA(0,1,3)(0,0,0)[0]             : AIC=3479.069, Time=0.17 sec
 ARIMA(1,1,2)(0,0,0)[0]             : AIC=3475.709, Time=0.36 sec
 ARIMA(2,1,3)(0,0,0)[0]             : AIC=3475.589, Time=0.56 sec
 ARIMA(0,1,2)(0,0,0)[0]             : AIC=3477.849, Time=0.12 sec
 ARIMA(2,1,2)(0,0,0)[0]             : AIC=3477.732, Time=0.60 sec

Best model:  ARIMA(1,1,3)(0,0,0)[0]
Total fit time: 11.509 seconds
Performing stepwise search to minimize aic

/usr/local/lib/python3.10/dist-packages/statsmodels/tsa/base/
tsa_model.py:836: ValueWarning: No supported index is available.
Prediction results will be given with an integer index beginning at
`start`.
  return get_prediction_index(
/usr/local/lib/python3.10/dist-packages/statsmodels/tsa/base/tsa_model
.py:836: FutureWarning: No supported index is available. In the next
version, calling this method in a model without a supported index will
result in an exception.
  return get_prediction_index(

 ARIMA(1,1,1)(0,0,0)[0] intercept   : AIC=509.097, Time=0.19 sec
 ARIMA(0,1,0)(0,0,0)[0] intercept   : AIC=609.485, Time=0.08 sec
 ARIMA(1,1,0)(0,0,0)[0] intercept   : AIC=548.793, Time=0.06 sec
 ARIMA(0,1,1)(0,0,0)[0] intercept   : AIC=507.123, Time=0.13 sec
 ARIMA(0,1,0)(0,0,0)[0]             : AIC=607.485, Time=0.02 sec
 ARIMA(0,1,2)(0,0,0)[0] intercept   : AIC=509.097, Time=0.14 sec
 ARIMA(1,1,2)(0,0,0)[0] intercept   : AIC=499.199, Time=0.24 sec
 ARIMA(2,1,2)(0,0,0)[0] intercept   : AIC=496.581, Time=0.27 sec
 ARIMA(2,1,1)(0,0,0)[0] intercept   : AIC=503.415, Time=0.20 sec
 ARIMA(3,1,2)(0,0,0)[0] intercept   : AIC=488.610, Time=0.43 sec
 ARIMA(3,1,1)(0,0,0)[0] intercept   : AIC=inf, Time=0.73 sec
 ARIMA(3,1,3)(0,0,0)[0] intercept   : AIC=490.354, Time=0.72 sec
 ARIMA(2,1,3)(0,0,0)[0] intercept   : AIC=492.354, Time=0.40 sec
 ARIMA(3,1,2)(0,0,0)[0]             : AIC=486.635, Time=0.20 sec
 ARIMA(2,1,2)(0,0,0)[0]             : AIC=494.599, Time=0.15 sec
 ARIMA(3,1,1)(0,0,0)[0]             : AIC=inf, Time=0.40 sec
 ARIMA(3,1,3)(0,0,0)[0]             : AIC=488.390, Time=0.36 sec
 ARIMA(2,1,1)(0,0,0)[0]             : AIC=501.422, Time=0.10 sec
 ARIMA(2,1,3)(0,0,0)[0]             : AIC=490.381, Time=0.20 sec

Best model:  ARIMA(3,1,2)(0,0,0)[0]
Total fit time: 5.054 seconds
```

```
Warning: Invalid prediction range for item B0BNL5LTYH. Skipping
forecast.
Performing stepwise search to minimize aic
 ARIMA(1,1,1)(0,0,0)[0] intercept   : AIC=785.633, Time=0.22 sec
 ARIMA(0,1,0)(0,0,0)[0] intercept   : AIC=931.272, Time=0.03 sec
 ARIMA(1,1,0)(0,0,0)[0] intercept   : AIC=865.658, Time=0.06 sec
 ARIMA(0,1,1)(0,0,0)[0] intercept   : AIC=783.721, Time=0.17 sec
 ARIMA(0,1,0)(0,0,0)[0]             : AIC=929.272, Time=0.02 sec
 ARIMA(0,1,2)(0,0,0)[0] intercept   : AIC=785.597, Time=0.16 sec
 ARIMA(1,1,2)(0,0,0)[0] intercept   : AIC=784.134, Time=0.42 sec
 ARIMA(0,1,1)(0,0,0)[0]             : AIC=781.733, Time=0.05 sec
 ARIMA(1,1,1)(0,0,0)[0]             : AIC=783.645, Time=0.09 sec
 ARIMA(0,1,2)(0,0,0)[0]             : AIC=783.609, Time=0.10 sec
 ARIMA(1,1,0)(0,0,0)[0]             : AIC=863.658, Time=0.04 sec
 ARIMA(1,1,2)(0,0,0)[0]             : AIC=782.145, Time=0.24 sec

Best model:  ARIMA(0,1,1)(0,0,0)[0]
Total fit time: 1.622 seconds
Warning: Invalid prediction range for item B0BNL1J5XS. Skipping
forecast.
Performing stepwise search to minimize aic
 ARIMA(1,0,1)(0,0,0)[0]             : AIC=492.475, Time=0.06 sec
 ARIMA(0,0,0)(0,0,0)[0]             : AIC=533.860, Time=0.04 sec
 ARIMA(1,0,0)(0,0,0)[0]             : AIC=501.870, Time=0.03 sec
 ARIMA(0,0,1)(0,0,0)[0]             : AIC=509.274, Time=0.04 sec
 ARIMA(2,0,1)(0,0,0)[0]             : AIC=493.735, Time=0.13 sec
 ARIMA(1,0,2)(0,0,0)[0]             : AIC=493.670, Time=0.13 sec
 ARIMA(0,0,2)(0,0,0)[0]             : AIC=507.983, Time=0.05 sec
 ARIMA(2,0,0)(0,0,0)[0]             : AIC=498.771, Time=0.05 sec
 ARIMA(2,0,2)(0,0,0)[0]             : AIC=inf, Time=1.48 sec
 ARIMA(1,0,1)(0,0,0)[0] intercept   : AIC=487.358, Time=0.81 sec
 ARIMA(0,0,1)(0,0,0)[0] intercept   : AIC=492.851, Time=0.19 sec
 ARIMA(1,0,0)(0,0,0)[0] intercept   : AIC=489.856, Time=0.12 sec
 ARIMA(2,0,1)(0,0,0)[0] intercept   : AIC=489.303, Time=1.60 sec
 ARIMA(1,0,2)(0,0,0)[0] intercept   : AIC=489.267, Time=0.46 sec
 ARIMA(0,0,0)(0,0,0)[0] intercept   : AIC=508.104, Time=0.05 sec
 ARIMA(0,0,2)(0,0,0)[0] intercept   : AIC=493.564, Time=0.10 sec
 ARIMA(2,0,0)(0,0,0)[0] intercept   : AIC=489.784, Time=0.10 sec
 ARIMA(2,0,2)(0,0,0)[0] intercept   : AIC=inf, Time=0.62 sec

Best model:  ARIMA(1,0,1)(0,0,0)[0] intercept
Total fit time: 6.090 seconds
Performing stepwise search to minimize aic

/usr/local/lib/python3.10/dist-packages/statsmodels/tsa/base/
tsa_model.py:836: ValueWarning: No supported index is available.
Prediction results will be given with an integer index beginning at
`start`.
  return get_prediction_index(
/usr/local/lib/python3.10/dist-packages/statsmodels/tsa/base/tsa_model
```

```
 ARIMA(1,1,1)(0,0,0)[0] intercept   : AIC=952.750, Time=0.18 sec
 ARIMA(0,1,0)(0,0,0)[0] intercept   : AIC=1055.406, Time=0.02 sec
 ARIMA(1,1,0)(0,0,0)[0] intercept   : AIC=977.658, Time=0.06 sec
 ARIMA(0,1,1)(0,0,0)[0] intercept   : AIC=950.756, Time=0.09 sec
 ARIMA(0,1,0)(0,0,0)[0]             : AIC=1053.406, Time=0.04 sec
 ARIMA(0,1,2)(0,0,0)[0] intercept   : AIC=952.752, Time=0.14 sec
 ARIMA(1,1,2)(0,0,0)[0] intercept   : AIC=inf, Time=0.33 sec
 ARIMA(0,1,1)(0,0,0)[0]             : AIC=948.757, Time=0.04 sec
 ARIMA(1,1,1)(0,0,0)[0]             : AIC=950.751, Time=0.07 sec
 ARIMA(0,1,2)(0,0,0)[0]             : AIC=950.753, Time=0.10 sec
 ARIMA(1,1,0)(0,0,0)[0]             : AIC=975.658, Time=0.03 sec
 ARIMA(1,1,2)(0,0,0)[0]             : AIC=inf, Time=0.21 sec

Best model:  ARIMA(0,1,1)(0,0,0)[0]
Total fit time: 1.337 seconds
Warning: Invalid prediction range for item B0BNL1QKLV. Skipping
forecast.
Performing stepwise search to minimize aic
 ARIMA(1,1,1)(0,0,0)[0] intercept   : AIC=124.513, Time=0.31 sec
 ARIMA(0,1,0)(0,0,0)[0] intercept   : AIC=223.518, Time=0.04 sec
 ARIMA(1,1,0)(0,0,0)[0] intercept   : AIC=171.324, Time=0.11 sec
 ARIMA(0,1,1)(0,0,0)[0] intercept   : AIC=126.717, Time=0.11 sec
 ARIMA(0,1,0)(0,0,0)[0]             : AIC=221.518, Time=0.02 sec
 ARIMA(2,1,1)(0,0,0)[0] intercept   : AIC=125.677, Time=0.23 sec
 ARIMA(1,1,2)(0,0,0)[0] intercept   : AIC=122.934, Time=0.41 sec
 ARIMA(0,1,2)(0,0,0)[0] intercept   : AIC=123.515, Time=0.24 sec
 ARIMA(2,1,2)(0,0,0)[0] intercept   : AIC=127.765, Time=0.44 sec
 ARIMA(1,1,3)(0,0,0)[0] intercept   : AIC=126.918, Time=0.59 sec
 ARIMA(0,1,3)(0,0,0)[0] intercept   : AIC=124.569, Time=0.33 sec
 ARIMA(2,1,3)(0,0,0)[0] intercept   : AIC=126.900, Time=0.52 sec
 ARIMA(1,1,2)(0,0,0)[0]             : AIC=120.964, Time=0.14 sec
 ARIMA(0,1,2)(0,0,0)[0]             : AIC=121.526, Time=0.08 sec
 ARIMA(1,1,1)(0,0,0)[0]             : AIC=122.552, Time=0.07 sec
 ARIMA(2,1,2)(0,0,0)[0]             : AIC=125.793, Time=0.22 sec
 ARIMA(1,1,3)(0,0,0)[0]             : AIC=124.924, Time=0.15 sec
 ARIMA(0,1,1)(0,0,0)[0]             : AIC=124.964, Time=0.06 sec
 ARIMA(0,1,3)(0,0,0)[0]             : AIC=122.569, Time=0.08 sec
 ARIMA(2,1,1)(0,0,0)[0]             : AIC=123.692, Time=0.11 sec
 ARIMA(2,1,3)(0,0,0)[0]             : AIC=124.857, Time=0.48 sec

Best model:  ARIMA(1,1,2)(0,0,0)[0]
Total fit time: 4.769 seconds
Warning: Invalid prediction range for item B0BNL3NZV7. Skipping
forecast.
Performing stepwise search to minimize aic
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 ARIMA(1,0,1)(0,0,0)[0]                  : AIC=393.261, Time=0.15 sec
 ARIMA(0,0,0)(0,0,0)[0]                  : AIC=441.226, Time=0.04 sec
 ARIMA(1,0,0)(0,0,0)[0]                  : AIC=428.328, Time=0.03 sec
 ARIMA(0,0,1)(0,0,0)[0]                  : AIC=432.366, Time=0.04 sec
 ARIMA(2,0,1)(0,0,0)[0]                  : AIC=395.107, Time=0.24 sec
 ARIMA(1,0,2)(0,0,0)[0]                  : AIC=395.092, Time=0.17 sec
 ARIMA(0,0,2)(0,0,0)[0]                  : AIC=429.264, Time=0.06 sec
 ARIMA(2,0,0)(0,0,0)[0]                  : AIC=421.967, Time=0.04 sec
 ARIMA(2,0,2)(0,0,0)[0]                  : AIC=395.558, Time=0.24 sec
 ARIMA(1,0,1)(0,0,0)[0] intercept   : AIC=391.608, Time=0.35 sec
 ARIMA(0,0,1)(0,0,0)[0] intercept   : AIC=398.570, Time=0.06 sec
 ARIMA(1,0,0)(0,0,0)[0] intercept   : AIC=398.378, Time=0.05 sec
 ARIMA(2,0,1)(0,0,0)[0] intercept   : AIC=393.397, Time=0.46 sec
 ARIMA(1,0,2)(0,0,0)[0] intercept   : AIC=393.371, Time=0.38 sec
 ARIMA(0,0,0)(0,0,0)[0] intercept   : AIC=398.028, Time=0.06 sec
 ARIMA(0,0,2)(0,0,0)[0] intercept   : AIC=399.886, Time=0.09 sec
 ARIMA(2,0,0)(0,0,0)[0] intercept   : AIC=399.328, Time=0.09 sec
 ARIMA(2,0,2)(0,0,0)[0] intercept   : AIC=393.866, Time=1.66 sec

Best model:  ARIMA(1,0,1)(0,0,0)[0] intercept
Total fit time: 4.235 seconds
 ARIMA(0,0,0)(0,0,0)[0]                  : AIC=-315.820, Time=0.03 sec
Total fit time: 0.030 seconds
Warning: Invalid prediction range for item B0BNL1BVRR. Skipping
forecast.
Performing stepwise search to minimize aic

/usr/local/lib/python3.10/dist-packages/statsmodels/tsa/base/
tsa_model.py:836: ValueWarning: No supported index is available.
Prediction results will be given with an integer index beginning at
`start`.
  return get_prediction_index(
/usr/local/lib/python3.10/dist-packages/statsmodels/tsa/base/tsa_model
.py:836: FutureWarning: No supported index is available. In the next
version, calling this method in a model without a supported index will
result in an exception.
  return get_prediction_index(
/usr/local/lib/python3.10/dist-packages/pmdarima/arima/auto.py:444:
UserWarning: Input time-series is completely constant; returning a (0,
0, 0) ARMA.
  warnings.warn('Input time-series is completely constant; '

 ARIMA(1,0,1)(0,0,0)[0]                  : AIC=531.285, Time=0.54 sec
 ARIMA(0,0,0)(0,0,0)[0]                  : AIC=600.118, Time=0.05 sec
 ARIMA(1,0,0)(0,0,0)[0]                  : AIC=557.560, Time=0.05 sec
 ARIMA(0,0,1)(0,0,0)[0]                  : AIC=572.603, Time=0.06 sec
 ARIMA(2,0,1)(0,0,0)[0]                  : AIC=532.346, Time=0.42 sec
 ARIMA(1,0,2)(0,0,0)[0]                  : AIC=532.483, Time=1.02 sec
 ARIMA(0,0,2)(0,0,0)[0]                  : AIC=563.160, Time=0.43 sec
 ARIMA(2,0,0)(0,0,0)[0]                  : AIC=546.032, Time=0.10 sec
```

```
 ARIMA(2,0,2)(0,0,0)[0]             : AIC=535.121, Time=0.38 sec
 ARIMA(1,0,1)(0,0,0)[0] intercept   : AIC=524.479, Time=0.28 sec
 ARIMA(0,0,1)(0,0,0)[0] intercept   : AIC=534.032, Time=0.06 sec
 ARIMA(1,0,0)(0,0,0)[0] intercept   : AIC=530.517, Time=0.06 sec
 ARIMA(2,0,1)(0,0,0)[0] intercept   : AIC=526.471, Time=0.23 sec
 ARIMA(1,0,2)(0,0,0)[0] intercept   : AIC=526.469, Time=0.20 sec
 ARIMA(0,0,0)(0,0,0)[0] intercept   : AIC=544.247, Time=0.07 sec
 ARIMA(0,0,2)(0,0,0)[0] intercept   : AIC=532.063, Time=0.09 sec
 ARIMA(2,0,0)(0,0,0)[0] intercept   : AIC=528.022, Time=0.12 sec
 ARIMA(2,0,2)(0,0,0)[0] intercept   : AIC=528.039, Time=0.20 sec

Best model:  ARIMA(1,0,1)(0,0,0)[0] intercept
Total fit time: 4.397 seconds

/usr/local/lib/python3.10/dist-packages/statsmodels/tsa/base/
tsa_model.py:836: ValueWarning: No supported index is available.
Prediction results will be given with an integer index beginning at
`start`.
  return get_prediction_index(
/usr/local/lib/python3.10/dist-packages/statsmodels/tsa/base/tsa_model
.py:836: FutureWarning: No supported index is available. In the next
version, calling this method in a model without a supported index will
result in an exception.
  return get_prediction_index(

Performing stepwise search to minimize aic
 ARIMA(1,0,1)(0,0,0)[0]             : AIC=642.907, Time=0.22 sec
 ARIMA(0,0,0)(0,0,0)[0]             : AIC=694.125, Time=0.03 sec
 ARIMA(1,0,0)(0,0,0)[0]             : AIC=660.303, Time=0.03 sec
 ARIMA(0,0,1)(0,0,0)[0]             : AIC=667.421, Time=0.04 sec
 ARIMA(2,0,1)(0,0,0)[0]             : AIC=inf, Time=0.33 sec
 ARIMA(1,0,2)(0,0,0)[0]             : AIC=inf, Time=0.33 sec
 ARIMA(0,0,2)(0,0,0)[0]             : AIC=664.765, Time=0.06 sec
 ARIMA(2,0,0)(0,0,0)[0]             : AIC=658.497, Time=0.04 sec
 ARIMA(2,0,2)(0,0,0)[0]             : AIC=inf, Time=0.57 sec
 ARIMA(1,0,1)(0,0,0)[0] intercept   : AIC=629.685, Time=0.11 sec
 ARIMA(0,0,1)(0,0,0)[0] intercept   : AIC=628.017, Time=0.08 sec
 ARIMA(0,0,0)(0,0,0)[0] intercept   : AIC=636.602, Time=0.07 sec
 ARIMA(0,0,2)(0,0,0)[0] intercept   : AIC=629.832, Time=0.11 sec
 ARIMA(1,0,0)(0,0,0)[0] intercept   : AIC=627.692, Time=0.06 sec
 ARIMA(2,0,0)(0,0,0)[0] intercept   : AIC=629.686, Time=0.09 sec
 ARIMA(2,0,1)(0,0,0)[0] intercept   : AIC=631.684, Time=0.26 sec

Best model:  ARIMA(1,0,0)(0,0,0)[0] intercept
Total fit time: 2.465 seconds
Performing stepwise search to minimize aic
 ARIMA(1,0,1)(0,0,0)[0]             : AIC=213.981, Time=0.05 sec
 ARIMA(0,0,0)(0,0,0)[0]             : AIC=237.859, Time=0.03 sec
 ARIMA(1,0,0)(0,0,0)[0]             : AIC=215.213, Time=0.03 sec
 ARIMA(0,0,1)(0,0,0)[0]             : AIC=212.427, Time=0.03 sec
```

```
/usr/local/lib/python3.10/dist-packages/statsmodels/tsa/base/
tsa_model.py:836: ValueWarning: No supported index is available.
Prediction results will be given with an integer index beginning at
`start`.
  return get_prediction_index(
/usr/local/lib/python3.10/dist-packages/statsmodels/tsa/base/tsa_model
.py:836: FutureWarning: No supported index is available. In the next
version, calling this method in a model without a supported index will
result in an exception.
  return get_prediction_index(

 ARIMA(0,0,2)(0,0,0)[0]                : AIC=213.920, Time=0.07 sec
 ARIMA(1,0,2)(0,0,0)[0]                : AIC=212.755, Time=0.22 sec
 ARIMA(0,0,1)(0,0,0)[0] intercept   : AIC=208.142, Time=0.07 sec
 ARIMA(0,0,0)(0,0,0)[0] intercept   : AIC=229.225, Time=0.06 sec
 ARIMA(1,0,1)(0,0,0)[0] intercept   : AIC=210.114, Time=0.11 sec
 ARIMA(0,0,2)(0,0,0)[0] intercept   : AIC=210.105, Time=0.08 sec
 ARIMA(1,0,0)(0,0,0)[0] intercept   : AIC=212.353, Time=0.16 sec
 ARIMA(1,0,2)(0,0,0)[0] intercept   : AIC=211.119, Time=0.20 sec

Best model:  ARIMA(0,0,1)(0,0,0)[0] intercept
Total fit time: 1.106 seconds
Warning: Invalid prediction range for item B0BNL4VP6Q. Skipping
forecast.
Performing stepwise search to minimize aic
 ARIMA(1,1,1)(0,0,0)[0] intercept   : AIC=766.904, Time=0.35 sec
 ARIMA(0,1,0)(0,0,0)[0] intercept   : AIC=902.289, Time=0.02 sec
 ARIMA(1,1,0)(0,0,0)[0] intercept   : AIC=851.058, Time=0.07 sec
 ARIMA(0,1,1)(0,0,0)[0] intercept   : AIC=766.131, Time=0.13 sec
 ARIMA(0,1,0)(0,0,0)[0]                : AIC=900.300, Time=0.03 sec
 ARIMA(0,1,2)(0,0,0)[0] intercept   : AIC=766.453, Time=0.29 sec
 ARIMA(1,1,2)(0,0,0)[0] intercept   : AIC=767.168, Time=0.37 sec
 ARIMA(0,1,1)(0,0,0)[0]                : AIC=764.196, Time=0.22 sec
 ARIMA(1,1,1)(0,0,0)[0]                : AIC=764.981, Time=0.10 sec
 ARIMA(0,1,2)(0,0,0)[0]                : AIC=764.533, Time=0.12 sec
 ARIMA(1,1,0)(0,0,0)[0]                : AIC=849.077, Time=0.04 sec
 ARIMA(1,1,2)(0,0,0)[0]                : AIC=765.239, Time=0.11 sec

Best model:  ARIMA(0,1,1)(0,0,0)[0]
Total fit time: 1.875 seconds
Warning: Invalid prediction range for item B0BNL4WZQV. Skipping
forecast.
Performing stepwise search to minimize aic
 ARIMA(1,0,1)(0,0,0)[0]                : AIC=175.527, Time=0.14 sec
 ARIMA(0,0,0)(0,0,0)[0]                : AIC=212.888, Time=0.03 sec
 ARIMA(1,0,0)(0,0,0)[0]                : AIC=198.351, Time=0.03 sec
 ARIMA(0,0,1)(0,0,0)[0]                : AIC=203.776, Time=0.03 sec
 ARIMA(2,0,1)(0,0,0)[0]                : AIC=177.461, Time=0.13 sec
 ARIMA(1,0,2)(0,0,0)[0]                : AIC=177.462, Time=0.13 sec
 ARIMA(0,0,2)(0,0,0)[0]                : AIC=196.788, Time=0.10 sec
```

```
 ARIMA(2,0,0)(0,0,0)[0]                 : AIC=190.736, Time=0.04 sec
 ARIMA(2,0,2)(0,0,0)[0]                 : AIC=inf, Time=0.38 sec
 ARIMA(1,0,1)(0,0,0)[0] intercept       : AIC=174.554, Time=0.19 sec
 ARIMA(0,0,1)(0,0,0)[0] intercept       : AIC=183.148, Time=0.06 sec
 ARIMA(1,0,0)(0,0,0)[0] intercept       : AIC=182.037, Time=0.06 sec
 ARIMA(2,0,1)(0,0,0)[0] intercept       : AIC=176.484, Time=0.29 sec
 ARIMA(1,0,2)(0,0,0)[0] intercept       : AIC=176.484, Time=0.27 sec
 ARIMA(0,0,0)(0,0,0)[0] intercept       : AIC=184.765, Time=0.06 sec
 ARIMA(0,0,2)(0,0,0)[0] intercept       : AIC=181.353, Time=0.09 sec
 ARIMA(2,0,0)(0,0,0)[0] intercept       : AIC=180.298, Time=0.08 sec
 ARIMA(2,0,2)(0,0,0)[0] intercept       : AIC=178.445, Time=0.68 sec

Best model:  ARIMA(1,0,1)(0,0,0)[0] intercept
Total fit time: 2.839 seconds
Warning: Invalid prediction range for item B0BNL53HF3. Skipping
forecast.
Performing stepwise search to minimize aic
 ARIMA(1,1,1)(0,0,0)[0] intercept       : AIC=393.504, Time=1.44 sec
 ARIMA(0,1,0)(0,0,0)[0] intercept       : AIC=575.023, Time=0.13 sec
 ARIMA(1,1,0)(0,0,0)[0] intercept       : AIC=510.587, Time=0.07 sec
 ARIMA(0,1,1)(0,0,0)[0] intercept       : AIC=391.648, Time=0.76 sec
 ARIMA(0,1,0)(0,0,0)[0]                 : AIC=573.023, Time=0.04 sec
 ARIMA(0,1,2)(0,0,0)[0] intercept       : AIC=393.457, Time=0.68 sec
 ARIMA(1,1,2)(0,0,0)[0] intercept       : AIC=395.644, Time=1.54 sec
 ARIMA(0,1,1)(0,0,0)[0]                 : AIC=390.075, Time=0.08 sec
 ARIMA(1,1,1)(0,0,0)[0]                 : AIC=391.921, Time=0.16 sec
 ARIMA(0,1,2)(0,0,0)[0]                 : AIC=391.871, Time=0.10 sec
 ARIMA(1,1,0)(0,0,0)[0]                 : AIC=508.587, Time=0.04 sec
 ARIMA(1,1,2)(0,0,0)[0]                 : AIC=393.137, Time=0.26 sec

Best model:  ARIMA(0,1,1)(0,0,0)[0]
Total fit time: 5.309 seconds
Warning: Invalid prediction range for item B0BNL17RLC. Skipping
forecast.
Performing stepwise search to minimize aic
 ARIMA(1,1,1)(0,0,0)[0] intercept       : AIC=inf, Time=0.59 sec
 ARIMA(0,1,0)(0,0,0)[0] intercept       : AIC=1133.297, Time=0.03 sec
 ARIMA(1,1,0)(0,0,0)[0] intercept       : AIC=1128.254, Time=0.06 sec
 ARIMA(0,1,1)(0,0,0)[0] intercept       : AIC=inf, Time=0.26 sec
 ARIMA(0,1,0)(0,0,0)[0]                 : AIC=1131.297, Time=0.02 sec
 ARIMA(2,1,0)(0,0,0)[0] intercept       : AIC=1090.361, Time=0.09 sec
 ARIMA(3,1,0)(0,0,0)[0] intercept       : AIC=1086.115, Time=0.12 sec
 ARIMA(3,1,1)(0,0,0)[0] intercept       : AIC=inf, Time=0.80 sec
 ARIMA(2,1,1)(0,0,0)[0] intercept       : AIC=inf, Time=0.88 sec
 ARIMA(3,1,0)(0,0,0)[0]                 : AIC=1084.115, Time=0.06 sec
 ARIMA(2,1,0)(0,0,0)[0]                 : AIC=1088.361, Time=0.05 sec
 ARIMA(3,1,1)(0,0,0)[0]                 : AIC=1035.202, Time=0.24 sec
 ARIMA(2,1,1)(0,0,0)[0]                 : AIC=1034.711, Time=0.14 sec
 ARIMA(1,1,1)(0,0,0)[0]                 : AIC=1044.809, Time=0.11 sec
```

```
 ARIMA(2,1,2)(0,0,0)[0]                    : AIC=1033.349, Time=0.25 sec
 ARIMA(1,1,2)(0,0,0)[0]                    : AIC=1031.350, Time=0.11 sec
 ARIMA(0,1,2)(0,0,0)[0]                    : AIC=1029.685, Time=0.11 sec
 ARIMA(0,1,1)(0,0,0)[0]                    : AIC=1083.178, Time=0.05 sec
 ARIMA(0,1,3)(0,0,0)[0]                    : AIC=1031.349, Time=0.15 sec
 ARIMA(1,1,3)(0,0,0)[0]                    : AIC=1033.316, Time=0.30 sec
 ARIMA(0,1,2)(0,0,0)[0] intercept   : AIC=inf, Time=0.42 sec

Best model:  ARIMA(0,1,2)(0,0,0)[0]
Total fit time: 4.867 seconds
Performing stepwise search to minimize aic
 ARIMA(1,0,1)(0,0,0)[0]                    : AIC=2437.611, Time=0.07 sec
 ARIMA(0,0,0)(0,0,0)[0]                    : AIC=2949.934, Time=0.02 sec
 ARIMA(1,0,0)(0,0,0)[0]                    : AIC=2465.408, Time=0.04 sec

/usr/local/lib/python3.10/dist-packages/statsmodels/tsa/base/
tsa_model.py:836: ValueWarning: No supported index is available.
Prediction results will be given with an integer index beginning at
`start`.
  return get_prediction_index(
/usr/local/lib/python3.10/dist-packages/statsmodels/tsa/base/tsa_model
.py:836: FutureWarning: No supported index is available. In the next
version, calling this method in a model without a supported index will
result in an exception.
  return get_prediction_index(

 ARIMA(0,0,1)(0,0,0)[0]                    : AIC=2703.006, Time=0.08 sec
 ARIMA(2,0,1)(0,0,0)[0]                    : AIC=2434.893, Time=0.15 sec
 ARIMA(2,0,0)(0,0,0)[0]                    : AIC=2446.772, Time=0.05 sec
 ARIMA(3,0,1)(0,0,0)[0]                    : AIC=2436.875, Time=0.20 sec
 ARIMA(2,0,2)(0,0,0)[0]                    : AIC=2436.867, Time=0.26 sec
 ARIMA(1,0,2)(0,0,0)[0]                    : AIC=2435.278, Time=0.12 sec
 ARIMA(3,0,0)(0,0,0)[0]                    : AIC=2439.473, Time=0.09 sec
 ARIMA(3,0,2)(0,0,0)[0]                    : AIC=2438.891, Time=0.17 sec
 ARIMA(2,0,1)(0,0,0)[0] intercept   : AIC=2430.488, Time=0.26 sec
 ARIMA(1,0,1)(0,0,0)[0] intercept   : AIC=2431.038, Time=0.17 sec
 ARIMA(2,0,0)(0,0,0)[0] intercept   : AIC=2436.628, Time=0.13 sec
 ARIMA(3,0,1)(0,0,0)[0] intercept   : AIC=2432.451, Time=0.54 sec
 ARIMA(2,0,2)(0,0,0)[0] intercept   : AIC=2432.044, Time=0.69 sec
 ARIMA(1,0,0)(0,0,0)[0] intercept   : AIC=2449.154, Time=0.09 sec
 ARIMA(1,0,2)(0,0,0)[0] intercept   : AIC=2430.416, Time=0.26 sec
 ARIMA(0,0,2)(0,0,0)[0] intercept   : AIC=2531.532, Time=0.24 sec
 ARIMA(1,0,3)(0,0,0)[0] intercept   : AIC=2432.416, Time=0.37 sec
 ARIMA(0,0,1)(0,0,0)[0] intercept   : AIC=2593.939, Time=0.18 sec
 ARIMA(0,0,3)(0,0,0)[0] intercept   : AIC=2495.922, Time=0.70 sec
 ARIMA(2,0,3)(0,0,0)[0] intercept   : AIC=2433.693, Time=3.60 sec

Best model:  ARIMA(1,0,2)(0,0,0)[0] intercept
Total fit time: 8.539 seconds
Performing stepwise search to minimize aic
```

```
 ARIMA(1,1,1)(0,0,0)[0] intercept   : AIC=641.543, Time=0.12 sec
 ARIMA(0,1,0)(0,0,0)[0] intercept   : AIC=678.497, Time=0.02 sec

/usr/local/lib/python3.10/dist-packages/statsmodels/tsa/base/
tsa_model.py:836: ValueWarning: No supported index is available.
Prediction results will be given with an integer index beginning at
`start`.
  return get_prediction_index(
/usr/local/lib/python3.10/dist-packages/statsmodels/tsa/base/tsa_model
.py:836: FutureWarning: No supported index is available. In the next
version, calling this method in a model without a supported index will
result in an exception.
  return get_prediction_index(

 ARIMA(1,1,0)(0,0,0)[0] intercept   : AIC=640.404, Time=0.07 sec
 ARIMA(0,1,1)(0,0,0)[0] intercept   : AIC=644.299, Time=0.07 sec
 ARIMA(0,1,0)(0,0,0)[0]             : AIC=676.501, Time=0.02 sec
 ARIMA(2,1,0)(0,0,0)[0] intercept   : AIC=640.998, Time=0.07 sec
 ARIMA(2,1,1)(0,0,0)[0] intercept   : AIC=642.457, Time=0.20 sec
 ARIMA(1,1,0)(0,0,0)[0]             : AIC=638.405, Time=0.03 sec
 ARIMA(2,1,0)(0,0,0)[0]             : AIC=638.999, Time=0.05 sec
 ARIMA(1,1,1)(0,0,0)[0]             : AIC=639.545, Time=0.07 sec
 ARIMA(0,1,1)(0,0,0)[0]             : AIC=642.301, Time=0.03 sec
 ARIMA(2,1,1)(0,0,0)[0]             : AIC=640.459, Time=0.13 sec

Best model:  ARIMA(1,1,0)(0,0,0)[0]
Total fit time: 0.898 seconds
Warning: Invalid prediction range for item B0BRDC22VH. Skipping
forecast.
Performing stepwise search to minimize aic
 ARIMA(1,0,1)(0,0,0)[0]             : AIC=5208.763, Time=0.11 sec
 ARIMA(0,0,0)(0,0,0)[0]             : AIC=5631.882, Time=0.02 sec
 ARIMA(1,0,0)(0,0,0)[0]             : AIC=5208.209, Time=0.05 sec
 ARIMA(0,0,1)(0,0,0)[0]             : AIC=5362.643, Time=0.09 sec
 ARIMA(2,0,0)(0,0,0)[0]             : AIC=5209.484, Time=0.05 sec
 ARIMA(2,0,1)(0,0,0)[0]             : AIC=5193.109, Time=0.30 sec
 ARIMA(3,0,1)(0,0,0)[0]             : AIC=5185.218, Time=0.34 sec
 ARIMA(3,0,0)(0,0,0)[0]             : AIC=5195.249, Time=0.15 sec
 ARIMA(3,0,2)(0,0,0)[0]             : AIC=5186.886, Time=0.42 sec
 ARIMA(2,0,2)(0,0,0)[0]             : AIC=5184.962, Time=0.29 sec
 ARIMA(1,0,2)(0,0,0)[0]             : AIC=5184.671, Time=0.20 sec
 ARIMA(0,0,2)(0,0,0)[0]             : AIC=5290.765, Time=0.11 sec
 ARIMA(1,0,3)(0,0,0)[0]             : AIC=5184.869, Time=0.25 sec
 ARIMA(0,0,3)(0,0,0)[0]             : AIC=5265.388, Time=0.19 sec
 ARIMA(2,0,3)(0,0,0)[0]             : AIC=5186.855, Time=0.58 sec
 ARIMA(1,0,2)(0,0,0)[0] intercept   : AIC=5182.076, Time=0.44 sec
 ARIMA(0,0,2)(0,0,0)[0] intercept   : AIC=5248.279, Time=0.44 sec
 ARIMA(1,0,1)(0,0,0)[0] intercept   : AIC=5198.550, Time=0.31 sec
 ARIMA(2,0,2)(0,0,0)[0] intercept   : AIC=5182.777, Time=0.89 sec
 ARIMA(1,0,3)(0,0,0)[0] intercept   : AIC=5182.676, Time=0.53 sec
```

```
 ARIMA(0,0,1)(0,0,0)[0] intercept   : AIC=5301.188, Time=0.28 sec
 ARIMA(0,0,3)(0,0,0)[0] intercept   : AIC=5231.669, Time=0.57 sec
 ARIMA(2,0,1)(0,0,0)[0] intercept   : AIC=5188.795, Time=0.82 sec
 ARIMA(2,0,3)(0,0,0)[0] intercept   : AIC=5184.639, Time=1.03 sec

Best model:  ARIMA(1,0,2)(0,0,0)[0] intercept
Total fit time: 8.512 seconds
Performing stepwise search to minimize aic
 ARIMA(1,0,1)(0,0,0)[0]             : AIC=4784.086, Time=0.11 sec
 ARIMA(0,0,0)(0,0,0)[0]             : AIC=5044.311, Time=0.02 sec

/usr/local/lib/python3.10/dist-packages/statsmodels/tsa/base/
tsa_model.py:836: ValueWarning: No supported index is available.
Prediction results will be given with an integer index beginning at
`start`.
  return get_prediction_index(
/usr/local/lib/python3.10/dist-packages/statsmodels/tsa/base/tsa_model
.py:836: FutureWarning: No supported index is available. In the next
version, calling this method in a model without a supported index will
result in an exception.
  return get_prediction_index(

 ARIMA(1,0,0)(0,0,0)[0]             : AIC=4862.329, Time=0.09 sec
 ARIMA(0,0,1)(0,0,0)[0]             : AIC=4784.525, Time=0.07 sec
 ARIMA(2,0,1)(0,0,0)[0]             : AIC=4783.240, Time=0.28 sec
 ARIMA(2,0,0)(0,0,0)[0]             : AIC=4836.976, Time=0.26 sec
 ARIMA(3,0,1)(0,0,0)[0]             : AIC=4782.150, Time=1.02 sec
 ARIMA(3,0,0)(0,0,0)[0]             : AIC=4799.128, Time=0.69 sec
 ARIMA(3,0,2)(0,0,0)[0]             : AIC=4774.919, Time=2.33 sec
 ARIMA(2,0,2)(0,0,0)[0]             : AIC=4773.312, Time=0.33 sec
 ARIMA(1,0,2)(0,0,0)[0]             : AIC=4771.397, Time=0.25 sec
 ARIMA(0,0,2)(0,0,0)[0]             : AIC=4784.493, Time=0.11 sec
 ARIMA(1,0,3)(0,0,0)[0]             : AIC=4773.318, Time=0.41 sec
 ARIMA(0,0,3)(0,0,0)[0]             : AIC=4784.177, Time=0.15 sec
 ARIMA(2,0,3)(0,0,0)[0]             : AIC=4775.381, Time=0.37 sec
 ARIMA(1,0,2)(0,0,0)[0] intercept   : AIC=4770.239, Time=0.57 sec
 ARIMA(0,0,2)(0,0,0)[0] intercept   : AIC=4773.868, Time=0.35 sec
 ARIMA(1,0,1)(0,0,0)[0] intercept   : AIC=4773.752, Time=0.36 sec
 ARIMA(2,0,2)(0,0,0)[0] intercept   : AIC=4771.925, Time=0.74 sec
 ARIMA(1,0,3)(0,0,0)[0] intercept   : AIC=4771.907, Time=0.71 sec
 ARIMA(0,0,1)(0,0,0)[0] intercept   : AIC=4772.697, Time=0.22 sec
 ARIMA(0,0,3)(0,0,0)[0] intercept   : AIC=4774.657, Time=0.47 sec
 ARIMA(2,0,1)(0,0,0)[0] intercept   : AIC=4774.335, Time=0.65 sec
 ARIMA(2,0,3)(0,0,0)[0] intercept   : AIC=4773.828, Time=1.29 sec

Best model:  ARIMA(1,0,2)(0,0,0)[0] intercept
Total fit time: 11.882 seconds
Performing stepwise search to minimize aic
```

```
/usr/local/lib/python3.10/dist-packages/statsmodels/tsa/base/
tsa_model.py:836: ValueWarning: No supported index is available.
Prediction results will be given with an integer index beginning at
`start`.
  return get_prediction_index(
/usr/local/lib/python3.10/dist-packages/statsmodels/tsa/base/tsa_model
.py:836: FutureWarning: No supported index is available. In the next
version, calling this method in a model without a supported index will
result in an exception.
  return get_prediction_index(

 ARIMA(1,1,1)(0,0,0)[0] intercept   : AIC=3067.736, Time=0.20 sec
 ARIMA(0,1,0)(0,0,0)[0] intercept   : AIC=3249.349, Time=0.03 sec
 ARIMA(1,1,0)(0,0,0)[0] intercept   : AIC=3142.723, Time=0.09 sec
 ARIMA(0,1,1)(0,0,0)[0] intercept   : AIC=3065.761, Time=0.10 sec
 ARIMA(0,1,0)(0,0,0)[0]             : AIC=3247.350, Time=0.03 sec
 ARIMA(0,1,2)(0,0,0)[0] intercept   : AIC=3067.729, Time=0.20 sec
 ARIMA(1,1,2)(0,0,0)[0] intercept   : AIC=3068.630, Time=0.45 sec
 ARIMA(0,1,1)(0,0,0)[0]             : AIC=3063.828, Time=0.04 sec
 ARIMA(1,1,1)(0,0,0)[0]             : AIC=3065.803, Time=0.10 sec
 ARIMA(0,1,2)(0,0,0)[0]             : AIC=3065.794, Time=0.11 sec
 ARIMA(1,1,0)(0,0,0)[0]             : AIC=3140.729, Time=0.05 sec
 ARIMA(1,1,2)(0,0,0)[0]             : AIC=3066.674, Time=0.20 sec

Best model:  ARIMA(0,1,1)(0,0,0)[0]
Total fit time: 1.638 seconds
Performing stepwise search to minimize aic

/usr/local/lib/python3.10/dist-packages/statsmodels/tsa/base/
tsa_model.py:836: ValueWarning: No supported index is available.
Prediction results will be given with an integer index beginning at
`start`.
  return get_prediction_index(
/usr/local/lib/python3.10/dist-packages/statsmodels/tsa/base/tsa_model
.py:836: FutureWarning: No supported index is available. In the next
version, calling this method in a model without a supported index will
result in an exception.
  return get_prediction_index(

 ARIMA(1,1,1)(0,0,0)[0] intercept   : AIC=4756.237, Time=0.40 sec
 ARIMA(0,1,0)(0,0,0)[0] intercept   : AIC=4892.471, Time=0.03 sec
 ARIMA(1,1,0)(0,0,0)[0] intercept   : AIC=4881.120, Time=0.06 sec
 ARIMA(0,1,1)(0,0,0)[0] intercept   : AIC=4837.454, Time=0.20 sec
 ARIMA(0,1,0)(0,0,0)[0]             : AIC=4890.471, Time=0.03 sec
 ARIMA(2,1,1)(0,0,0)[0] intercept   : AIC=4748.348, Time=0.43 sec
 ARIMA(2,1,0)(0,0,0)[0] intercept   : AIC=4813.561, Time=0.59 sec
 ARIMA(3,1,1)(0,0,0)[0] intercept   : AIC=4741.050, Time=2.14 sec
 ARIMA(3,1,0)(0,0,0)[0] intercept   : AIC=4802.445, Time=1.66 sec
 ARIMA(3,1,2)(0,0,0)[0] intercept   : AIC=4743.050, Time=1.32 sec
 ARIMA(2,1,2)(0,0,0)[0] intercept   : AIC=4742.724, Time=0.63 sec
```

```
 ARIMA(3,1,1)(0,0,0)[0]                 : AIC=4739.062, Time=0.42 sec
 ARIMA(2,1,1)(0,0,0)[0]                 : AIC=4746.351, Time=0.24 sec
 ARIMA(3,1,0)(0,0,0)[0]                 : AIC=4800.445, Time=0.12 sec
 ARIMA(3,1,2)(0,0,0)[0]                 : AIC=4741.062, Time=1.01 sec
 ARIMA(2,1,0)(0,0,0)[0]                 : AIC=4811.561, Time=0.10 sec
 ARIMA(2,1,2)(0,0,0)[0]                 : AIC=4740.729, Time=0.42 sec

Best model:  ARIMA(3,1,1)(0,0,0)[0]
Total fit time: 9.835 seconds
Performing stepwise search to minimize aic

/usr/local/lib/python3.10/dist-packages/statsmodels/tsa/base/
tsa_model.py:836: ValueWarning: No supported index is available.
Prediction results will be given with an integer index beginning at
`start`.
  return get_prediction_index(
/usr/local/lib/python3.10/dist-packages/statsmodels/tsa/base/tsa_model
.py:836: FutureWarning: No supported index is available. In the next
version, calling this method in a model without a supported index will
result in an exception.
  return get_prediction_index(

 ARIMA(1,1,1)(0,0,0)[0] intercept   : AIC=3449.131, Time=0.38 sec
 ARIMA(0,1,0)(0,0,0)[0] intercept   : AIC=3591.169, Time=0.03 sec
 ARIMA(1,1,0)(0,0,0)[0] intercept   : AIC=3586.702, Time=0.11 sec
 ARIMA(0,1,1)(0,0,0)[0] intercept   : AIC=3539.801, Time=0.13 sec
 ARIMA(0,1,0)(0,0,0)[0]             : AIC=3589.169, Time=0.03 sec
 ARIMA(2,1,1)(0,0,0)[0] intercept   : AIC=3425.053, Time=0.46 sec
 ARIMA(2,1,0)(0,0,0)[0] intercept   : AIC=3488.545, Time=0.19 sec
 ARIMA(3,1,1)(0,0,0)[0] intercept   : AIC=3411.504, Time=0.56 sec
 ARIMA(3,1,0)(0,0,0)[0] intercept   : AIC=3486.953, Time=0.25 sec
 ARIMA(3,1,2)(0,0,0)[0] intercept   : AIC=3399.425, Time=0.53 sec
 ARIMA(2,1,2)(0,0,0)[0] intercept   : AIC=3398.040, Time=0.47 sec
 ARIMA(1,1,2)(0,0,0)[0] intercept   : AIC=3396.273, Time=0.34 sec
 ARIMA(0,1,2)(0,0,0)[0] intercept   : AIC=3394.997, Time=0.27 sec
 ARIMA(0,1,3)(0,0,0)[0] intercept   : AIC=3396.328, Time=0.34 sec
 ARIMA(1,1,3)(0,0,0)[0] intercept   : AIC=3398.192, Time=0.80 sec
 ARIMA(0,1,2)(0,0,0)[0]             : AIC=3393.008, Time=0.10 sec
 ARIMA(0,1,1)(0,0,0)[0]             : AIC=3537.801, Time=0.06 sec
 ARIMA(1,1,2)(0,0,0)[0]             : AIC=3394.281, Time=0.18 sec
 ARIMA(0,1,3)(0,0,0)[0]             : AIC=3394.336, Time=0.17 sec
 ARIMA(1,1,1)(0,0,0)[0]             : AIC=3447.156, Time=0.19 sec
 ARIMA(1,1,3)(0,0,0)[0]             : AIC=3396.200, Time=2.03 sec

Best model:  ARIMA(0,1,2)(0,0,0)[0]
Total fit time: 7.656 seconds
Performing stepwise search to minimize aic

/usr/local/lib/python3.10/dist-packages/statsmodels/tsa/base/
tsa_model.py:836: ValueWarning: No supported index is available.
```

Prediction results will be given with an integer index beginning at
`start`.
  return get_prediction_index(
/usr/local/lib/python3.10/dist-packages/statsmodels/tsa/base/tsa_model
.py:836: FutureWarning: No supported index is available. In the next
version, calling this method in a model without a supported index will
result in an exception.
  return get_prediction_index(

```
 ARIMA(1,1,1)(0,0,0)[0] intercept   : AIC=328.508, Time=0.56 sec
 ARIMA(0,1,0)(0,0,0)[0] intercept   : AIC=461.948, Time=0.08 sec
 ARIMA(1,1,0)(0,0,0)[0] intercept   : AIC=423.869, Time=0.08 sec
 ARIMA(0,1,1)(0,0,0)[0] intercept   : AIC=329.020, Time=1.18 sec
 ARIMA(0,1,0)(0,0,0)[0]             : AIC=459.958, Time=0.06 sec
 ARIMA(2,1,1)(0,0,0)[0] intercept   : AIC=327.728, Time=0.54 sec
 ARIMA(2,1,0)(0,0,0)[0] intercept   : AIC=381.335, Time=0.15 sec
 ARIMA(3,1,1)(0,0,0)[0] intercept   : AIC=328.154, Time=0.52 sec
 ARIMA(2,1,2)(0,0,0)[0] intercept   : AIC=326.936, Time=0.68 sec
 ARIMA(1,1,2)(0,0,0)[0] intercept   : AIC=325.183, Time=0.60 sec
 ARIMA(0,1,2)(0,0,0)[0] intercept   : AIC=327.748, Time=0.25 sec
 ARIMA(1,1,3)(0,0,0)[0] intercept   : AIC=326.941, Time=1.00 sec
 ARIMA(0,1,3)(0,0,0)[0] intercept   : AIC=326.507, Time=0.55 sec
 ARIMA(2,1,3)(0,0,0)[0] intercept   : AIC=328.932, Time=0.81 sec
 ARIMA(1,1,2)(0,0,0)[0]             : AIC=325.088, Time=0.28 sec
 ARIMA(0,1,2)(0,0,0)[0]             : AIC=327.883, Time=0.17 sec
 ARIMA(1,1,1)(0,0,0)[0]             : AIC=328.555, Time=0.11 sec
 ARIMA(2,1,2)(0,0,0)[0]             : AIC=326.672, Time=0.19 sec
 ARIMA(1,1,3)(0,0,0)[0]             : AIC=326.664, Time=0.32 sec
 ARIMA(0,1,1)(0,0,0)[0]             : AIC=328.615, Time=0.08 sec
 ARIMA(0,1,3)(0,0,0)[0]             : AIC=326.047, Time=0.19 sec
 ARIMA(2,1,1)(0,0,0)[0]             : AIC=327.233, Time=0.13 sec
 ARIMA(2,1,3)(0,0,0)[0]             : AIC=328.663, Time=0.45 sec
```

Best model: ARIMA(1,1,2)(0,0,0)[0]
Total fit time: 8.994 seconds
Performing stepwise search to minimize aic

/usr/local/lib/python3.10/dist-packages/statsmodels/tsa/base/
tsa_model.py:836: ValueWarning: No supported index is available.
Prediction results will be given with an integer index beginning at
`start`.
  return get_prediction_index(
/usr/local/lib/python3.10/dist-packages/statsmodels/tsa/base/tsa_model
.py:836: FutureWarning: No supported index is available. In the next
version, calling this method in a model without a supported index will
result in an exception.
  return get_prediction_index(

```
 ARIMA(1,1,1)(0,0,0)[0] intercept   : AIC=4023.008, Time=0.28 sec
 ARIMA(0,1,0)(0,0,0)[0] intercept   : AIC=4101.447, Time=0.03 sec
```

```
ARIMA(1,1,0)(0,0,0)[0] intercept   : AIC=4084.033, Time=0.11 sec
ARIMA(0,1,1)(0,0,0)[0] intercept   : AIC=4057.457, Time=0.19 sec
ARIMA(0,1,0)(0,0,0)[0]             : AIC=4099.461, Time=0.03 sec
ARIMA(2,1,1)(0,0,0)[0] intercept   : AIC=4018.290, Time=0.34 sec
ARIMA(2,1,0)(0,0,0)[0] intercept   : AIC=4044.667, Time=0.18 sec
ARIMA(3,1,1)(0,0,0)[0] intercept   : AIC=4019.601, Time=0.48 sec
ARIMA(2,1,2)(0,0,0)[0] intercept   : AIC=4018.786, Time=0.48 sec
ARIMA(1,1,2)(0,0,0)[0] intercept   : AIC=4016.884, Time=0.32 sec
ARIMA(0,1,2)(0,0,0)[0] intercept   : AIC=4014.983, Time=0.21 sec
ARIMA(0,1,3)(0,0,0)[0] intercept   : AIC=4016.894, Time=0.31 sec
ARIMA(1,1,3)(0,0,0)[0] intercept   : AIC=4018.733, Time=1.61 sec
ARIMA(0,1,2)(0,0,0)[0]             : AIC=4013.053, Time=0.53 sec
ARIMA(0,1,1)(0,0,0)[0]             : AIC=4055.491, Time=0.15 sec
ARIMA(1,1,2)(0,0,0)[0]             : AIC=4014.954, Time=0.44 sec
ARIMA(0,1,3)(0,0,0)[0]             : AIC=4014.964, Time=0.27 sec
ARIMA(1,1,1)(0,0,0)[0]             : AIC=4021.075, Time=0.28 sec
ARIMA(1,1,3)(0,0,0)[0]             : AIC=4016.802, Time=1.58 sec

Best model:  ARIMA(0,1,2)(0,0,0)[0]
Total fit time: 7.883 seconds
Performing stepwise search to minimize aic
ARIMA(1,0,1)(0,0,0)[0]             : AIC=1994.109, Time=0.13 sec
```

/usr/local/lib/python3.10/dist-packages/statsmodels/tsa/base/
tsa_model.py:836: ValueWarning: No supported index is available.
Prediction results will be given with an integer index beginning at
`start`.
  return get_prediction_index(
/usr/local/lib/python3.10/dist-packages/statsmodels/tsa/base/tsa_model
.py:836: FutureWarning: No supported index is available. In the next
version, calling this method in a model without a supported index will
result in an exception.
  return get_prediction_index(

```
ARIMA(0,0,0)(0,0,0)[0]             : AIC=2008.774, Time=0.02 sec
ARIMA(1,0,0)(0,0,0)[0]             : AIC=1995.521, Time=0.04 sec
ARIMA(0,0,1)(0,0,0)[0]             : AIC=1997.056, Time=0.04 sec
ARIMA(2,0,1)(0,0,0)[0]             : AIC=1990.068, Time=0.20 sec
ARIMA(2,0,0)(0,0,0)[0]             : AIC=1996.941, Time=0.05 sec
ARIMA(3,0,1)(0,0,0)[0]             : AIC=1991.993, Time=0.30 sec
ARIMA(2,0,2)(0,0,0)[0]             : AIC=1991.996, Time=0.25 sec
ARIMA(1,0,2)(0,0,0)[0]             : AIC=1990.009, Time=0.12 sec
ARIMA(0,0,2)(0,0,0)[0]             : AIC=1997.754, Time=0.06 sec
ARIMA(1,0,3)(0,0,0)[0]             : AIC=1991.996, Time=0.29 sec
ARIMA(0,0,3)(0,0,0)[0]             : AIC=1998.895, Time=0.06 sec
ARIMA(2,0,3)(0,0,0)[0]             : AIC=1993.230, Time=0.45 sec
ARIMA(1,0,2)(0,0,0)[0] intercept   : AIC=1990.356, Time=0.47 sec

Best model:  ARIMA(1,0,2)(0,0,0)[0]
Total fit time: 2.511 seconds
```

```
Performing stepwise search to minimize aic
 ARIMA(1,0,1)(0,0,0)[0]                 : AIC=237.409, Time=0.10 sec
 ARIMA(0,0,0)(0,0,0)[0]                 : AIC=267.712, Time=0.04 sec

/usr/local/lib/python3.10/dist-packages/statsmodels/tsa/base/
tsa_model.py:836: ValueWarning: No supported index is available.
Prediction results will be given with an integer index beginning at
`start`.
   return get_prediction_index(
/usr/local/lib/python3.10/dist-packages/statsmodels/tsa/base/tsa_model
.py:836: FutureWarning: No supported index is available. In the next
version, calling this method in a model without a supported index will
result in an exception.
   return get_prediction_index(

 ARIMA(1,0,0)(0,0,0)[0]                 : AIC=254.729, Time=0.04 sec
 ARIMA(0,0,1)(0,0,0)[0]                 : AIC=259.326, Time=0.07 sec
 ARIMA(2,0,1)(0,0,0)[0]                 : AIC=238.531, Time=0.13 sec
 ARIMA(1,0,2)(0,0,0)[0]                 : AIC=238.661, Time=0.14 sec
 ARIMA(0,0,2)(0,0,0)[0]                 : AIC=251.261, Time=0.05 sec
 ARIMA(2,0,0)(0,0,0)[0]                 : AIC=247.819, Time=0.06 sec
 ARIMA(2,0,2)(0,0,0)[0]                 : AIC=240.662, Time=0.23 sec
 ARIMA(1,0,1)(0,0,0)[0] intercept       : AIC=234.235, Time=0.21 sec
 ARIMA(0,0,1)(0,0,0)[0] intercept       : AIC=234.707, Time=0.07 sec
 ARIMA(1,0,0)(0,0,0)[0] intercept       : AIC=234.117, Time=0.06 sec
 ARIMA(0,0,0)(0,0,0)[0] intercept       : AIC=235.236, Time=0.07 sec
 ARIMA(2,0,0)(0,0,0)[0] intercept       : AIC=233.729, Time=0.08 sec
 ARIMA(3,0,0)(0,0,0)[0] intercept       : AIC=235.612, Time=0.09 sec
 ARIMA(2,0,1)(0,0,0)[0] intercept       : AIC=235.684, Time=0.32 sec
 ARIMA(3,0,1)(0,0,0)[0] intercept       : AIC=235.502, Time=0.29 sec

Best model:  ARIMA(2,0,0)(0,0,0)[0] intercept
Total fit time: 2.052 seconds
Warning: Invalid prediction range for item B0BNKY2YCQ. Skipping
forecast.
Performing stepwise search to minimize aic
 ARIMA(1,1,1)(0,0,0)[0] intercept       : AIC=715.551, Time=0.28 sec
 ARIMA(0,1,0)(0,0,0)[0] intercept       : AIC=914.450, Time=0.02 sec
 ARIMA(1,1,0)(0,0,0)[0] intercept       : AIC=799.287, Time=0.07 sec
 ARIMA(0,1,1)(0,0,0)[0] intercept       : AIC=720.172, Time=0.15 sec
 ARIMA(0,1,0)(0,0,0)[0]                 : AIC=912.450, Time=0.02 sec
 ARIMA(2,1,1)(0,0,0)[0] intercept       : AIC=716.649, Time=0.28 sec
 ARIMA(1,1,2)(0,0,0)[0] intercept       : AIC=716.831, Time=0.40 sec
 ARIMA(0,1,2)(0,0,0)[0] intercept       : AIC=714.900, Time=0.22 sec
 ARIMA(0,1,3)(0,0,0)[0] intercept       : AIC=716.804, Time=0.28 sec
 ARIMA(1,1,3)(0,0,0)[0] intercept       : AIC=717.853, Time=0.72 sec
 ARIMA(0,1,2)(0,0,0)[0]                 : AIC=712.900, Time=0.08 sec
 ARIMA(0,1,1)(0,0,0)[0]                 : AIC=718.172, Time=0.06 sec
 ARIMA(1,1,2)(0,0,0)[0]                 : AIC=714.831, Time=0.15 sec
 ARIMA(0,1,3)(0,0,0)[0]                 : AIC=714.804, Time=0.10 sec
```

```
 ARIMA(1,1,1)(0,0,0)[0]                  : AIC=713.551, Time=0.09 sec
 ARIMA(1,1,3)(0,0,0)[0]                  : AIC=715.853, Time=0.29 sec

Best model:  ARIMA(0,1,2)(0,0,0)[0]
Total fit time: 3.255 seconds
Performing stepwise search to minimize aic

/usr/local/lib/python3.10/dist-packages/statsmodels/tsa/base/
tsa_model.py:836: ValueWarning: No supported index is available.
Prediction results will be given with an integer index beginning at
`start`.
  return get_prediction_index(
/usr/local/lib/python3.10/dist-packages/statsmodels/tsa/base/tsa_model
.py:836: FutureWarning: No supported index is available. In the next
version, calling this method in a model without a supported index will
result in an exception.
  return get_prediction_index(

 ARIMA(1,0,1)(0,0,0)[0]                  : AIC=inf, Time=0.25 sec
 ARIMA(0,0,0)(0,0,0)[0]                  : AIC=324.634, Time=0.03 sec
 ARIMA(1,0,0)(0,0,0)[0]                  : AIC=321.332, Time=0.03 sec
 ARIMA(0,0,1)(0,0,0)[0]                  : AIC=322.293, Time=0.03 sec
 ARIMA(2,0,0)(0,0,0)[0]                  : AIC=320.382, Time=0.05 sec
 ARIMA(3,0,0)(0,0,0)[0]                  : AIC=318.022, Time=0.07 sec
 ARIMA(3,0,1)(0,0,0)[0]                  : AIC=293.839, Time=0.29 sec
 ARIMA(2,0,1)(0,0,0)[0]                  : AIC=inf, Time=0.30 sec
 ARIMA(3,0,2)(0,0,0)[0]                  : AIC=inf, Time=0.37 sec
 ARIMA(2,0,2)(0,0,0)[0]                  : AIC=inf, Time=0.32 sec
 ARIMA(3,0,1)(0,0,0)[0] intercept   : AIC=290.886, Time=0.85 sec
 ARIMA(2,0,1)(0,0,0)[0] intercept   : AIC=288.891, Time=1.41 sec
 ARIMA(1,0,1)(0,0,0)[0] intercept   : AIC=287.264, Time=0.71 sec
 ARIMA(0,0,1)(0,0,0)[0] intercept   : AIC=285.561, Time=0.93 sec
 ARIMA(0,0,0)(0,0,0)[0] intercept   : AIC=283.814, Time=0.15 sec
 ARIMA(1,0,0)(0,0,0)[0] intercept   : AIC=285.590, Time=0.08 sec

Best model:  ARIMA(0,0,0)(0,0,0)[0] intercept
Total fit time: 5.906 seconds
Performing stepwise search to minimize aic

/usr/local/lib/python3.10/dist-packages/statsmodels/tsa/base/
tsa_model.py:836: ValueWarning: No supported index is available.
Prediction results will be given with an integer index beginning at
`start`.
  return get_prediction_index(
/usr/local/lib/python3.10/dist-packages/statsmodels/tsa/base/tsa_model
.py:836: FutureWarning: No supported index is available. In the next
version, calling this method in a model without a supported index will
result in an exception.
  return get_prediction_index(
```

```
 ARIMA(1,0,1)(0,0,0)[0]                : AIC=1333.682, Time=0.21 sec
 ARIMA(0,0,0)(0,0,0)[0]                : AIC=1420.031, Time=0.02 sec
 ARIMA(1,0,0)(0,0,0)[0]                : AIC=1340.390, Time=0.04 sec
 ARIMA(0,0,1)(0,0,0)[0]                : AIC=1352.989, Time=0.13 sec
 ARIMA(2,0,1)(0,0,0)[0]                : AIC=1322.087, Time=0.46 sec
 ARIMA(2,0,0)(0,0,0)[0]                : AIC=1341.163, Time=0.05 sec
 ARIMA(3,0,1)(0,0,0)[0]                : AIC=1322.488, Time=0.19 sec
 ARIMA(2,0,2)(0,0,0)[0]                : AIC=1321.470, Time=0.18 sec
 ARIMA(1,0,2)(0,0,0)[0]                : AIC=1320.110, Time=0.22 sec
 ARIMA(0,0,2)(0,0,0)[0]                : AIC=1350.370, Time=0.05 sec
 ARIMA(1,0,3)(0,0,0)[0]                : AIC=1321.614, Time=0.19 sec
 ARIMA(0,0,3)(0,0,0)[0]                : AIC=1343.821, Time=0.07 sec
 ARIMA(2,0,3)(0,0,0)[0]                : AIC=1322.676, Time=0.48 sec
 ARIMA(1,0,2)(0,0,0)[0] intercept      : AIC=1314.497, Time=0.33 sec
 ARIMA(0,0,2)(0,0,0)[0] intercept      : AIC=1319.960, Time=0.12 sec
 ARIMA(1,0,1)(0,0,0)[0] intercept      : AIC=1319.152, Time=0.15 sec
 ARIMA(2,0,2)(0,0,0)[0] intercept      : AIC=1314.873, Time=0.37 sec
 ARIMA(1,0,3)(0,0,0)[0] intercept      : AIC=1314.752, Time=0.30 sec
 ARIMA(0,0,1)(0,0,0)[0] intercept      : AIC=1318.619, Time=0.08 sec
 ARIMA(0,0,3)(0,0,0)[0] intercept      : AIC=1318.495, Time=0.18 sec
 ARIMA(2,0,1)(0,0,0)[0] intercept      : AIC=1318.332, Time=0.32 sec
 ARIMA(2,0,3)(0,0,0)[0] intercept      : AIC=1316.190, Time=0.82 sec

Best model:  ARIMA(1,0,2)(0,0,0)[0] intercept
Total fit time: 4.986 seconds
Performing stepwise search to minimize aic
 ARIMA(1,0,1)(0,0,0)[0]                : AIC=271.639, Time=0.07 sec
 ARIMA(0,0,0)(0,0,0)[0]                : AIC=292.973, Time=0.03 sec
 ARIMA(1,0,0)(0,0,0)[0]                : AIC=283.760, Time=0.03 sec

/usr/local/lib/python3.10/dist-packages/statsmodels/tsa/base/
tsa_model.py:836: ValueWarning: No supported index is available.
Prediction results will be given with an integer index beginning at
`start`.
  return get_prediction_index(
/usr/local/lib/python3.10/dist-packages/statsmodels/tsa/base/tsa_model
.py:836: FutureWarning: No supported index is available. In the next
version, calling this method in a model without a supported index will
result in an exception.
  return get_prediction_index(

 ARIMA(0,0,1)(0,0,0)[0]                : AIC=285.795, Time=0.06 sec
 ARIMA(2,0,1)(0,0,0)[0]                : AIC=273.424, Time=0.13 sec
 ARIMA(1,0,2)(0,0,0)[0]                : AIC=273.368, Time=0.14 sec
 ARIMA(0,0,2)(0,0,0)[0]                : AIC=286.001, Time=0.04 sec
 ARIMA(2,0,0)(0,0,0)[0]                : AIC=284.153, Time=0.06 sec
 ARIMA(2,0,2)(0,0,0)[0]                : AIC=275.150, Time=0.36 sec
 ARIMA(1,0,1)(0,0,0)[0] intercept      : AIC=269.816, Time=0.26 sec
 ARIMA(0,0,1)(0,0,0)[0] intercept      : AIC=270.534, Time=0.05 sec
 ARIMA(1,0,0)(0,0,0)[0] intercept      : AIC=270.448, Time=0.05 sec
```

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 ARIMA(2,0,1)(0,0,0)[0] intercept   : AIC=271.586, Time=0.28 sec
 ARIMA(1,0,2)(0,0,0)[0] intercept   : AIC=271.528, Time=0.38 sec
 ARIMA(0,0,0)(0,0,0)[0] intercept   : AIC=271.688, Time=0.06 sec
 ARIMA(0,0,2)(0,0,0)[0] intercept   : AIC=272.470, Time=0.07 sec
 ARIMA(2,0,0)(0,0,0)[0] intercept   : AIC=272.441, Time=0.06 sec
 ARIMA(2,0,2)(0,0,0)[0] intercept   : AIC=273.320, Time=0.45 sec

Best model:  ARIMA(1,0,1)(0,0,0)[0] intercept
Total fit time: 2.610 seconds
Warning: Invalid prediction range for item B0BNL3L7LR. Skipping
forecast.
Performing stepwise search to minimize aic
 ARIMA(1,1,1)(0,0,0)[0] intercept   : AIC=inf, Time=0.35 sec
 ARIMA(0,1,0)(0,0,0)[0] intercept   : AIC=1362.610, Time=0.02 sec
 ARIMA(1,1,0)(0,0,0)[0] intercept   : AIC=1362.703, Time=0.05 sec
 ARIMA(0,1,1)(0,0,0)[0] intercept   : AIC=1346.670, Time=0.08 sec
 ARIMA(0,1,0)(0,0,0)[0]             : AIC=1360.610, Time=0.04 sec
 ARIMA(0,1,2)(0,0,0)[0] intercept   : AIC=1282.586, Time=0.19 sec
 ARIMA(1,1,2)(0,0,0)[0] intercept   : AIC=1284.498, Time=0.19 sec
 ARIMA(0,1,3)(0,0,0)[0] intercept   : AIC=1284.488, Time=0.19 sec
 ARIMA(1,1,3)(0,0,0)[0] intercept   : AIC=1285.376, Time=0.47 sec
 ARIMA(0,1,2)(0,0,0)[0]             : AIC=1280.586, Time=0.07 sec
 ARIMA(0,1,1)(0,0,0)[0]             : AIC=1344.670, Time=0.04 sec
 ARIMA(1,1,2)(0,0,0)[0]             : AIC=1282.499, Time=0.11 sec
 ARIMA(0,1,3)(0,0,0)[0]             : AIC=1282.489, Time=0.11 sec
 ARIMA(1,1,1)(0,0,0)[0]             : AIC=1301.024, Time=0.12 sec
 ARIMA(1,1,3)(0,0,0)[0]             : AIC=1283.376, Time=0.29 sec

Best model:  ARIMA(0,1,2)(0,0,0)[0]
Total fit time: 2.341 seconds
Performing stepwise search to minimize aic
 ARIMA(1,0,1)(0,0,0)[0]             : AIC=221.296, Time=0.08 sec
 ARIMA(0,0,0)(0,0,0)[0]             : AIC=251.017, Time=0.03 sec

/usr/local/lib/python3.10/dist-packages/statsmodels/tsa/base/
tsa_model.py:836: ValueWarning: No supported index is available.
Prediction results will be given with an integer index beginning at
`start`.
  return get_prediction_index(
/usr/local/lib/python3.10/dist-packages/statsmodels/tsa/base/tsa_model
.py:836: FutureWarning: No supported index is available. In the next
version, calling this method in a model without a supported index will
result in an exception.
  return get_prediction_index(

 ARIMA(1,0,0)(0,0,0)[0]             : AIC=235.732, Time=0.05 sec
 ARIMA(0,0,1)(0,0,0)[0]             : AIC=241.150, Time=0.03 sec
 ARIMA(2,0,1)(0,0,0)[0]             : AIC=222.288, Time=0.14 sec
 ARIMA(1,0,2)(0,0,0)[0]             : AIC=222.531, Time=0.17 sec
 ARIMA(0,0,2)(0,0,0)[0]             : AIC=231.530, Time=0.15 sec
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 ARIMA(2,0,0)(0,0,0)[0]                     : AIC=227.047, Time=0.11 sec
 ARIMA(2,0,2)(0,0,0)[0]                     : AIC=224.180, Time=1.29 sec
 ARIMA(1,0,1)(0,0,0)[0] intercept   : AIC=217.783, Time=0.75 sec
 ARIMA(0,0,1)(0,0,0)[0] intercept   : AIC=221.660, Time=0.14 sec
 ARIMA(1,0,0)(0,0,0)[0] intercept   : AIC=220.109, Time=0.07 sec
 ARIMA(2,0,1)(0,0,0)[0] intercept   : AIC=218.709, Time=0.50 sec
 ARIMA(1,0,2)(0,0,0)[0] intercept   : AIC=218.053, Time=1.69 sec
 ARIMA(0,0,0)(0,0,0)[0] intercept   : AIC=224.452, Time=0.07 sec
 ARIMA(0,0,2)(0,0,0)[0] intercept   : AIC=217.050, Time=0.22 sec
 ARIMA(0,0,3)(0,0,0)[0] intercept   : AIC=217.399, Time=0.11 sec
 ARIMA(1,0,3)(0,0,0)[0] intercept   : AIC=218.245, Time=0.34 sec

Best model:  ARIMA(0,0,2)(0,0,0)[0] intercept
Total fit time: 5.976 seconds
Warning: Invalid prediction range for item B0BNL1RDVC. Skipping
forecast.
Performing stepwise search to minimize aic
 ARIMA(1,0,1)(0,0,0)[0]                     : AIC=47.427, Time=0.08 sec
 ARIMA(0,0,0)(0,0,0)[0]                     : AIC=51.193, Time=0.02 sec
 ARIMA(1,0,0)(0,0,0)[0]                     : AIC=52.248, Time=0.03 sec
 ARIMA(0,0,1)(0,0,0)[0]                     : AIC=52.378, Time=0.04 sec
 ARIMA(2,0,1)(0,0,0)[0]                     : AIC=48.109, Time=0.09 sec
 ARIMA(1,0,2)(0,0,0)[0]                     : AIC=46.710, Time=0.07 sec
 ARIMA(0,0,2)(0,0,0)[0]                     : AIC=54.236, Time=0.04 sec
 ARIMA(2,0,2)(0,0,0)[0]                     : AIC=47.449, Time=0.13 sec
 ARIMA(1,0,3)(0,0,0)[0]                     : AIC=46.263, Time=0.09 sec
 ARIMA(0,0,3)(0,0,0)[0]                     : AIC=48.984, Time=0.05 sec
 ARIMA(2,0,3)(0,0,0)[0]                     : AIC=46.393, Time=0.19 sec
 ARIMA(1,0,3)(0,0,0)[0] intercept   : AIC=46.002, Time=0.21 sec
 ARIMA(0,0,3)(0,0,0)[0] intercept   : AIC=44.976, Time=0.08 sec
 ARIMA(0,0,2)(0,0,0)[0] intercept   : AIC=48.609, Time=0.05 sec
 ARIMA(1,0,2)(0,0,0)[0] intercept   : AIC=46.658, Time=0.17 sec

Best model:  ARIMA(0,0,3)(0,0,0)[0] intercept
Total fit time: 1.382 seconds
Performing stepwise search to minimize aic

/usr/local/lib/python3.10/dist-packages/statsmodels/tsa/base/
tsa_model.py:836: ValueWarning: No supported index is available.
Prediction results will be given with an integer index beginning at
`start`.
  return get_prediction_index(
/usr/local/lib/python3.10/dist-packages/statsmodels/tsa/base/tsa_model
.py:836: FutureWarning: No supported index is available. In the next
version, calling this method in a model without a supported index will
result in an exception.
  return get_prediction_index(

 ARIMA(1,0,1)(0,0,0)[0]                     : AIC=410.642, Time=0.19 sec
 ARIMA(0,0,0)(0,0,0)[0]                     : AIC=432.365, Time=0.03 sec
```

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 ARIMA(1,0,0)(0,0,0)[0]                 : AIC=429.594, Time=0.03 sec
 ARIMA(0,0,1)(0,0,0)[0]                 : AIC=430.504, Time=0.03 sec
 ARIMA(2,0,1)(0,0,0)[0]                 : AIC=inf, Time=0.26 sec
 ARIMA(1,0,2)(0,0,0)[0]                 : AIC=inf, Time=0.29 sec
 ARIMA(0,0,2)(0,0,0)[0]                 : AIC=429.682, Time=0.05 sec
 ARIMA(2,0,0)(0,0,0)[0]                 : AIC=428.630, Time=0.04 sec
 ARIMA(2,0,2)(0,0,0)[0]                 : AIC=inf, Time=0.48 sec
 ARIMA(1,0,1)(0,0,0)[0] intercept   : AIC=408.144, Time=0.20 sec
 ARIMA(0,0,1)(0,0,0)[0] intercept   : AIC=406.152, Time=0.10 sec
 ARIMA(0,0,0)(0,0,0)[0] intercept   : AIC=404.296, Time=0.06 sec
 ARIMA(1,0,0)(0,0,0)[0] intercept   : AIC=406.149, Time=0.05 sec

Best model:  ARIMA(0,0,0)(0,0,0)[0] intercept
Total fit time: 1.834 seconds
Warning: Invalid prediction range for item B0BNL23MTF. Skipping
forecast.
Performing stepwise search to minimize aic
 ARIMA(1,0,1)(0,0,0)[0]                 : AIC=201.419, Time=0.11 sec
 ARIMA(0,0,0)(0,0,0)[0]                 : AIC=222.641, Time=0.03 sec
 ARIMA(1,0,0)(0,0,0)[0]                 : AIC=219.427, Time=0.03 sec
 ARIMA(0,0,1)(0,0,0)[0]                 : AIC=220.670, Time=0.05 sec
 ARIMA(2,0,1)(0,0,0)[0]                 : AIC=202.187, Time=0.12 sec
 ARIMA(1,0,2)(0,0,0)[0]                 : AIC=201.237, Time=0.10 sec
 ARIMA(0,0,2)(0,0,0)[0]                 : AIC=220.696, Time=0.04 sec
 ARIMA(2,0,2)(0,0,0)[0]                 : AIC=201.335, Time=0.11 sec
 ARIMA(1,0,3)(0,0,0)[0]                 : AIC=198.678, Time=0.13 sec
 ARIMA(0,0,3)(0,0,0)[0]                 : AIC=209.019, Time=0.06 sec
 ARIMA(2,0,3)(0,0,0)[0]                 : AIC=200.626, Time=0.16 sec
 ARIMA(1,0,3)(0,0,0)[0] intercept   : AIC=192.355, Time=0.20 sec
 ARIMA(0,0,3)(0,0,0)[0] intercept   : AIC=194.909, Time=0.12 sec
 ARIMA(1,0,2)(0,0,0)[0] intercept   : AIC=197.199, Time=0.32 sec
 ARIMA(2,0,3)(0,0,0)[0] intercept   : AIC=193.975, Time=0.29 sec
 ARIMA(0,0,2)(0,0,0)[0] intercept   : AIC=202.438, Time=0.11 sec
 ARIMA(2,0,2)(0,0,0)[0] intercept   : AIC=194.561, Time=0.46 sec

Best model:  ARIMA(1,0,3)(0,0,0)[0] intercept
Total fit time: 2.454 seconds
Performing stepwise search to minimize aic
 ARIMA(1,0,1)(0,0,0)[0]                 : AIC=1381.017, Time=0.05 sec
 ARIMA(0,0,0)(0,0,0)[0]                 : AIC=1382.100, Time=0.01 sec
 ARIMA(1,0,0)(0,0,0)[0]                 : AIC=1379.110, Time=0.03 sec
 ARIMA(0,0,1)(0,0,0)[0]                 : AIC=1379.321, Time=0.03 sec

/usr/local/lib/python3.10/dist-packages/statsmodels/tsa/base/
tsa_model.py:836: ValueWarning: No supported index is available.
Prediction results will be given with an integer index beginning at
`start`.
  return get_prediction_index(
/usr/local/lib/python3.10/dist-packages/statsmodels/tsa/base/tsa_model
.py:836: FutureWarning: No supported index is available. In the next
```

```
version, calling this method in a model without a supported index will
result in an exception.
  return get_prediction_index(

 ARIMA(2,0,0)(0,0,0)[0]                  : AIC=1381.054, Time=0.06 sec
 ARIMA(2,0,1)(0,0,0)[0]                  : AIC=1380.109, Time=0.23 sec
 ARIMA(1,0,0)(0,0,0)[0] intercept    : AIC=1375.723, Time=0.07 sec
 ARIMA(0,0,0)(0,0,0)[0] intercept    : AIC=1377.060, Time=0.02 sec
 ARIMA(2,0,0)(0,0,0)[0] intercept    : AIC=1377.710, Time=0.09 sec
 ARIMA(1,0,1)(0,0,0)[0] intercept    : AIC=1377.708, Time=0.12 sec
 ARIMA(0,0,1)(0,0,0)[0] intercept    : AIC=1375.715, Time=0.07 sec
 ARIMA(0,0,2)(0,0,0)[0] intercept    : AIC=1377.709, Time=0.11 sec
 ARIMA(1,0,2)(0,0,0)[0] intercept    : AIC=1379.708, Time=0.14 sec

Best model:  ARIMA(0,0,1)(0,0,0)[0] intercept
Total fit time: 1.060 seconds
Performing stepwise search to minimize aic

/usr/local/lib/python3.10/dist-packages/statsmodels/tsa/base/
tsa_model.py:836: ValueWarning: No supported index is available.
Prediction results will be given with an integer index beginning at
`start`.
  return get_prediction_index(
/usr/local/lib/python3.10/dist-packages/statsmodels/tsa/base/tsa_model
.py:836: FutureWarning: No supported index is available. In the next
version, calling this method in a model without a supported index will
result in an exception.
  return get_prediction_index(

 ARIMA(1,1,1)(0,0,0)[0] intercept    : AIC=917.914, Time=0.19 sec
 ARIMA(0,1,0)(0,0,0)[0] intercept    : AIC=974.324, Time=0.02 sec
 ARIMA(1,1,0)(0,0,0)[0] intercept    : AIC=938.273, Time=0.06 sec
 ARIMA(0,1,1)(0,0,0)[0] intercept    : AIC=920.145, Time=0.08 sec
 ARIMA(0,1,0)(0,0,0)[0]                  : AIC=972.324, Time=0.02 sec
 ARIMA(2,1,1)(0,0,0)[0] intercept    : AIC=inf, Time=0.82 sec
 ARIMA(1,1,2)(0,0,0)[0] intercept    : AIC=inf, Time=0.78 sec
 ARIMA(0,1,2)(0,0,0)[0] intercept    : AIC=918.919, Time=0.13 sec
 ARIMA(2,1,0)(0,0,0)[0] intercept    : AIC=930.608, Time=0.12 sec
 ARIMA(2,1,2)(0,0,0)[0] intercept    : AIC=inf, Time=3.31 sec
 ARIMA(1,1,1)(0,0,0)[0]                  : AIC=915.915, Time=0.70 sec
 ARIMA(0,1,1)(0,0,0)[0]                  : AIC=918.145, Time=0.10 sec
 ARIMA(1,1,0)(0,0,0)[0]                  : AIC=936.274, Time=0.05 sec
 ARIMA(2,1,1)(0,0,0)[0]                  : AIC=909.364, Time=0.45 sec
 ARIMA(2,1,0)(0,0,0)[0]                  : AIC=928.608, Time=0.05 sec
 ARIMA(3,1,1)(0,0,0)[0]                  : AIC=inf, Time=0.42 sec
 ARIMA(2,1,2)(0,0,0)[0]                  : AIC=inf, Time=0.59 sec
 ARIMA(1,1,2)(0,0,0)[0]                  : AIC=inf, Time=0.33 sec
 ARIMA(3,1,0)(0,0,0)[0]                  : AIC=924.082, Time=0.06 sec
 ARIMA(3,1,2)(0,0,0)[0]                  : AIC=908.846, Time=0.66 sec
 ARIMA(3,1,3)(0,0,0)[0]                  : AIC=inf, Time=1.03 sec
```

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 ARIMA(2,1,3)(0,0,0)[0]                    : AIC=907.749, Time=0.68 sec
 ARIMA(1,1,3)(0,0,0)[0]                    : AIC=inf, Time=0.66 sec
 ARIMA(2,1,3)(0,0,0)[0] intercept   : AIC=909.747, Time=1.05 sec

Best model:  ARIMA(2,1,3)(0,0,0)[0]
Total fit time: 12.409 seconds
Performing stepwise search to minimize aic
 ARIMA(1,0,1)(0,0,0)[0]                    : AIC=415.815, Time=0.11 sec
 ARIMA(0,0,0)(0,0,0)[0]                    : AIC=455.873, Time=0.03 sec

/usr/local/lib/python3.10/dist-packages/statsmodels/tsa/base/
tsa_model.py:836: ValueWarning: No supported index is available.
Prediction results will be given with an integer index beginning at
`start`.
  return get_prediction_index(
/usr/local/lib/python3.10/dist-packages/statsmodels/tsa/base/tsa_model
.py:836: FutureWarning: No supported index is available. In the next
version, calling this method in a model without a supported index will
result in an exception.
  return get_prediction_index(

 ARIMA(1,0,0)(0,0,0)[0]                    : AIC=439.257, Time=0.05 sec
 ARIMA(0,0,1)(0,0,0)[0]                    : AIC=444.819, Time=0.03 sec
 ARIMA(2,0,1)(0,0,0)[0]                    : AIC=417.306, Time=0.28 sec
 ARIMA(1,0,2)(0,0,0)[0]                    : AIC=417.162, Time=0.14 sec
 ARIMA(0,0,2)(0,0,0)[0]                    : AIC=440.521, Time=0.04 sec
 ARIMA(2,0,0)(0,0,0)[0]                    : AIC=430.604, Time=0.05 sec
 ARIMA(2,0,2)(0,0,0)[0]                    : AIC=418.541, Time=0.30 sec
 ARIMA(1,0,1)(0,0,0)[0] intercept   : AIC=413.167, Time=0.25 sec
 ARIMA(0,0,1)(0,0,0)[0] intercept   : AIC=424.719, Time=0.17 sec
 ARIMA(1,0,0)(0,0,0)[0] intercept   : AIC=423.119, Time=0.06 sec
 ARIMA(2,0,1)(0,0,0)[0] intercept   : AIC=414.272, Time=0.29 sec
 ARIMA(1,0,2)(0,0,0)[0] intercept   : AIC=413.907, Time=0.26 sec
 ARIMA(0,0,0)(0,0,0)[0] intercept   : AIC=428.268, Time=0.05 sec
 ARIMA(0,0,2)(0,0,0)[0] intercept   : AIC=423.785, Time=0.08 sec
 ARIMA(2,0,0)(0,0,0)[0] intercept   : AIC=420.159, Time=0.09 sec
 ARIMA(2,0,2)(0,0,0)[0] intercept   : AIC=412.077, Time=0.30 sec
 ARIMA(3,0,2)(0,0,0)[0] intercept   : AIC=407.121, Time=0.53 sec
 ARIMA(3,0,1)(0,0,0)[0] intercept   : AIC=414.390, Time=0.25 sec
 ARIMA(3,0,3)(0,0,0)[0] intercept   : AIC=406.303, Time=0.74 sec
 ARIMA(2,0,3)(0,0,0)[0] intercept   : AIC=408.651, Time=1.96 sec
 ARIMA(3,0,3)(0,0,0)[0]                    : AIC=409.871, Time=2.51 sec

Best model:  ARIMA(3,0,3)(0,0,0)[0] intercept
Total fit time: 8.612 seconds
Performing stepwise search to minimize aic
 ARIMA(1,1,1)(0,0,0)[0] intercept   : AIC=316.342, Time=0.12 sec
 ARIMA(0,1,0)(0,0,0)[0] intercept   : AIC=389.245, Time=0.02 sec
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/usr/local/lib/python3.10/dist-packages/statsmodels/tsa/base/
tsa_model.py:836: ValueWarning: No supported index is available.
Prediction results will be given with an integer index beginning at
`start`.
  return get_prediction_index(
/usr/local/lib/python3.10/dist-packages/statsmodels/tsa/base/tsa_model
.py:836: FutureWarning: No supported index is available. In the next
version, calling this method in a model without a supported index will
result in an exception.
  return get_prediction_index(

 ARIMA(1,1,0)(0,0,0)[0] intercept   : AIC=344.590, Time=0.05 sec
 ARIMA(0,1,1)(0,0,0)[0] intercept   : AIC=314.352, Time=0.37 sec
 ARIMA(0,1,0)(0,0,0)[0]             : AIC=387.245, Time=0.02 sec
 ARIMA(0,1,2)(0,0,0)[0] intercept   : AIC=316.344, Time=0.16 sec
 ARIMA(1,1,2)(0,0,0)[0] intercept   : AIC=315.694, Time=0.21 sec
 ARIMA(0,1,1)(0,0,0)[0]             : AIC=312.380, Time=0.05 sec
 ARIMA(1,1,1)(0,0,0)[0]             : AIC=314.365, Time=0.06 sec
 ARIMA(0,1,2)(0,0,0)[0]             : AIC=314.368, Time=0.06 sec
 ARIMA(1,1,0)(0,0,0)[0]             : AIC=342.593, Time=0.03 sec
 ARIMA(1,1,2)(0,0,0)[0]             : AIC=313.701, Time=0.12 sec

Best model:  ARIMA(0,1,1)(0,0,0)[0]
Total fit time: 1.289 seconds
Warning: Invalid prediction range for item B0BNL3ZHYM. Skipping
forecast.
Performing stepwise search to minimize aic
 ARIMA(1,0,1)(0,0,0)[0]             : AIC=201.551, Time=0.18 sec
 ARIMA(0,0,0)(0,0,0)[0]             : AIC=234.522, Time=0.03 sec
 ARIMA(1,0,0)(0,0,0)[0]             : AIC=234.676, Time=0.03 sec
 ARIMA(0,0,1)(0,0,0)[0]             : AIC=235.271, Time=0.03 sec
 ARIMA(2,0,1)(0,0,0)[0]             : AIC=196.772, Time=0.16 sec
 ARIMA(2,0,0)(0,0,0)[0]             : AIC=225.629, Time=0.04 sec
 ARIMA(3,0,1)(0,0,0)[0]             : AIC=198.127, Time=0.17 sec
 ARIMA(2,0,2)(0,0,0)[0]             : AIC=198.377, Time=0.27 sec
 ARIMA(1,0,2)(0,0,0)[0]             : AIC=196.398, Time=0.12 sec
 ARIMA(0,0,2)(0,0,0)[0]             : AIC=229.953, Time=0.04 sec
 ARIMA(1,0,3)(0,0,0)[0]             : AIC=198.363, Time=0.21 sec
 ARIMA(0,0,3)(0,0,0)[0]             : AIC=222.340, Time=0.07 sec
 ARIMA(2,0,3)(0,0,0)[0]             : AIC=199.558, Time=0.27 sec
 ARIMA(1,0,2)(0,0,0)[0] intercept   : AIC=193.092, Time=0.30 sec
 ARIMA(0,0,2)(0,0,0)[0] intercept   : AIC=197.241, Time=0.16 sec
 ARIMA(1,0,1)(0,0,0)[0] intercept   : AIC=198.397, Time=0.26 sec
 ARIMA(2,0,2)(0,0,0)[0] intercept   : AIC=195.080, Time=0.43 sec
 ARIMA(1,0,3)(0,0,0)[0] intercept   : AIC=195.074, Time=0.57 sec
 ARIMA(0,0,1)(0,0,0)[0] intercept   : AIC=196.914, Time=0.06 sec
 ARIMA(0,0,3)(0,0,0)[0] intercept   : AIC=195.994, Time=0.10 sec
 ARIMA(2,0,1)(0,0,0)[0] intercept   : AIC=193.864, Time=0.31 sec
 ARIMA(2,0,3)(0,0,0)[0] intercept   : AIC=196.107, Time=0.62 sec
```

```
Best model:  ARIMA(1,0,2)(0,0,0)[0] intercept
Total fit time: 4.465 seconds
Performing stepwise search to minimize aic

/usr/local/lib/python3.10/dist-packages/statsmodels/tsa/base/
tsa_model.py:836: ValueWarning: No supported index is available.
Prediction results will be given with an integer index beginning at
`start`.
  return get_prediction_index(
/usr/local/lib/python3.10/dist-packages/statsmodels/tsa/base/tsa_model
.py:836: FutureWarning: No supported index is available. In the next
version, calling this method in a model without a supported index will
result in an exception.
  return get_prediction_index(

 ARIMA(1,1,1)(0,0,0)[0] intercept   : AIC=309.872, Time=0.17 sec
 ARIMA(0,1,0)(0,0,0)[0] intercept   : AIC=408.733, Time=0.08 sec
 ARIMA(1,1,0)(0,0,0)[0] intercept   : AIC=344.253, Time=0.04 sec
 ARIMA(0,1,1)(0,0,0)[0] intercept   : AIC=308.571, Time=0.12 sec
 ARIMA(0,1,0)(0,0,0)[0]             : AIC=406.733, Time=0.02 sec
 ARIMA(0,1,2)(0,0,0)[0] intercept   : AIC=309.963, Time=0.14 sec
 ARIMA(1,1,2)(0,0,0)[0] intercept   : AIC=311.803, Time=0.29 sec
 ARIMA(0,1,1)(0,0,0)[0]             : AIC=306.581, Time=0.05 sec
 ARIMA(1,1,1)(0,0,0)[0]             : AIC=307.882, Time=0.07 sec
 ARIMA(0,1,2)(0,0,0)[0]             : AIC=307.972, Time=0.06 sec
 ARIMA(1,1,0)(0,0,0)[0]             : AIC=342.258, Time=0.04 sec
 ARIMA(1,1,2)(0,0,0)[0]             : AIC=309.813, Time=0.13 sec

Best model:  ARIMA(0,1,1)(0,0,0)[0]
Total fit time: 1.245 seconds
Warning: Invalid prediction range for item B0BNL49HMH. Skipping
forecast.
Performing stepwise search to minimize aic
 ARIMA(1,0,1)(0,0,0)[0]             : AIC=inf, Time=0.25 sec
 ARIMA(0,0,0)(0,0,0)[0]             : AIC=489.112, Time=0.03 sec
 ARIMA(1,0,0)(0,0,0)[0]             : AIC=491.021, Time=0.02 sec
 ARIMA(0,0,1)(0,0,0)[0]             : AIC=491.035, Time=0.03 sec
 ARIMA(0,0,0)(0,0,0)[0] intercept   : AIC=479.944, Time=0.06 sec
 ARIMA(1,0,0)(0,0,0)[0] intercept   : AIC=481.635, Time=0.05 sec
 ARIMA(0,0,1)(0,0,0)[0] intercept   : AIC=481.663, Time=0.07 sec
 ARIMA(1,0,1)(0,0,0)[0] intercept   : AIC=483.223, Time=0.15 sec

Best model:  ARIMA(0,0,0)(0,0,0)[0] intercept
Total fit time: 0.663 seconds
Performing stepwise search to minimize aic

/usr/local/lib/python3.10/dist-packages/statsmodels/tsa/base/
tsa_model.py:836: ValueWarning: No supported index is available.
Prediction results will be given with an integer index beginning at
`start`.
```

```
  return get_prediction_index(
/usr/local/lib/python3.10/dist-packages/statsmodels/tsa/base/tsa_model
.py:836: FutureWarning: No supported index is available. In the next
version, calling this method in a model without a supported index will
result in an exception.
  return get_prediction_index(

 ARIMA(1,0,1)(0,0,0)[0]                    : AIC=309.969, Time=0.13 sec
 ARIMA(0,0,0)(0,0,0)[0]                    : AIC=330.548, Time=0.04 sec
 ARIMA(1,0,0)(0,0,0)[0]                    : AIC=319.315, Time=0.03 sec
 ARIMA(0,0,1)(0,0,0)[0]                    : AIC=319.837, Time=0.04 sec
 ARIMA(2,0,1)(0,0,0)[0]                    : AIC=323.173, Time=0.15 sec
 ARIMA(1,0,2)(0,0,0)[0]                    : AIC=308.929, Time=0.22 sec
 ARIMA(0,0,2)(0,0,0)[0]                    : AIC=321.681, Time=0.05 sec
 ARIMA(2,0,2)(0,0,0)[0]                    : AIC=inf, Time=0.46 sec
 ARIMA(1,0,3)(0,0,0)[0]                    : AIC=309.136, Time=0.18 sec
 ARIMA(0,0,3)(0,0,0)[0]                    : AIC=322.393, Time=0.18 sec
 ARIMA(2,0,3)(0,0,0)[0]                    : AIC=309.872, Time=0.50 sec
 ARIMA(1,0,2)(0,0,0)[0] intercept   : AIC=307.752, Time=0.88 sec
 ARIMA(0,0,2)(0,0,0)[0] intercept   : AIC=305.770, Time=0.22 sec
 ARIMA(0,0,1)(0,0,0)[0] intercept   : AIC=304.315, Time=0.19 sec
 ARIMA(0,0,0)(0,0,0)[0] intercept   : AIC=307.728, Time=0.12 sec
 ARIMA(1,0,1)(0,0,0)[0] intercept   : AIC=305.783, Time=0.75 sec
 ARIMA(1,0,0)(0,0,0)[0] intercept   : AIC=305.019, Time=0.11 sec

Best model:  ARIMA(0,0,1)(0,0,0)[0] intercept
Total fit time: 4.273 seconds
Performing stepwise search to minimize aic

/usr/local/lib/python3.10/dist-packages/statsmodels/tsa/base/
tsa_model.py:836: ValueWarning: No supported index is available.
Prediction results will be given with an integer index beginning at
`start`.
  return get_prediction_index(
/usr/local/lib/python3.10/dist-packages/statsmodels/tsa/base/tsa_model
.py:836: FutureWarning: No supported index is available. In the next
version, calling this method in a model without a supported index will
result in an exception.
  return get_prediction_index(

 ARIMA(1,0,1)(0,0,0)[0]                    : AIC=660.809, Time=0.47 sec
 ARIMA(0,0,0)(0,0,0)[0]                    : AIC=692.958, Time=0.03 sec
 ARIMA(1,0,0)(0,0,0)[0]                    : AIC=665.096, Time=0.04 sec
 ARIMA(0,0,1)(0,0,0)[0]                    : AIC=668.970, Time=0.07 sec
 ARIMA(2,0,1)(0,0,0)[0]                    : AIC=653.168, Time=1.19 sec
 ARIMA(2,0,0)(0,0,0)[0]                    : AIC=666.821, Time=0.17 sec
 ARIMA(3,0,1)(0,0,0)[0]                    : AIC=653.941, Time=0.38 sec
 ARIMA(2,0,2)(0,0,0)[0]                    : AIC=654.264, Time=0.41 sec
 ARIMA(1,0,2)(0,0,0)[0]                    : AIC=652.267, Time=0.25 sec
 ARIMA(0,0,2)(0,0,0)[0]                    : AIC=668.325, Time=0.04 sec
```

```
 ARIMA(1,0,3)(0,0,0)[0]              : AIC=654.263, Time=0.21 sec
 ARIMA(0,0,3)(0,0,0)[0]              : AIC=669.854, Time=0.05 sec
 ARIMA(2,0,3)(0,0,0)[0]              : AIC=656.003, Time=0.30 sec
 ARIMA(1,0,2)(0,0,0)[0] intercept    : AIC=651.388, Time=0.59 sec
 ARIMA(0,0,2)(0,0,0)[0] intercept    : AIC=650.771, Time=0.08 sec
 ARIMA(0,0,1)(0,0,0)[0] intercept    : AIC=648.946, Time=0.07 sec
 ARIMA(0,0,0)(0,0,0)[0] intercept    : AIC=661.775, Time=0.02 sec
 ARIMA(1,0,1)(0,0,0)[0] intercept    : AIC=650.792, Time=0.14 sec
 ARIMA(1,0,0)(0,0,0)[0] intercept    : AIC=649.235, Time=0.06 sec

Best model:  ARIMA(0,0,1)(0,0,0)[0] intercept
Total fit time: 4.602 seconds
Warning: Invalid prediction range for item B0BNL4R8NS. Skipping
forecast.
Performing stepwise search to minimize aic
 ARIMA(1,0,1)(0,0,0)[0]              : AIC=1124.775, Time=0.06 sec
 ARIMA(0,0,0)(0,0,0)[0]              : AIC=1222.579, Time=0.02 sec
 ARIMA(1,0,0)(0,0,0)[0]              : AIC=1140.707, Time=0.03 sec
 ARIMA(0,0,1)(0,0,0)[0]              : AIC=1122.957, Time=0.04 sec
 ARIMA(0,0,2)(0,0,0)[0]              : AIC=1124.851, Time=0.05 sec
 ARIMA(1,0,2)(0,0,0)[0]              : AIC=1120.798, Time=0.21 sec
 ARIMA(2,0,2)(0,0,0)[0]              : AIC=1121.052, Time=0.21 sec
 ARIMA(1,0,3)(0,0,0)[0]              : AIC=1122.337, Time=0.25 sec
 ARIMA(0,0,3)(0,0,0)[0]              : AIC=1120.918, Time=0.07 sec
 ARIMA(2,0,1)(0,0,0)[0]              : AIC=1119.056, Time=0.11 sec
 ARIMA(2,0,0)(0,0,0)[0]              : AIC=1135.500, Time=0.05 sec
 ARIMA(3,0,1)(0,0,0)[0]              : AIC=1121.054, Time=0.14 sec
 ARIMA(3,0,0)(0,0,0)[0]              : AIC=1129.159, Time=0.05 sec
 ARIMA(3,0,2)(0,0,0)[0]              : AIC=1119.542, Time=0.53 sec
 ARIMA(2,0,1)(0,0,0)[0] intercept    : AIC=1114.696, Time=0.14 sec
 ARIMA(1,0,1)(0,0,0)[0] intercept    : AIC=1118.539, Time=0.13 sec
 ARIMA(2,0,0)(0,0,0)[0] intercept    : AIC=1129.877, Time=0.09 sec
 ARIMA(3,0,1)(0,0,0)[0] intercept    : AIC=1116.503, Time=0.29 sec
 ARIMA(2,0,2)(0,0,0)[0] intercept    : AIC=1116.395, Time=0.29 sec
 ARIMA(1,0,0)(0,0,0)[0] intercept    : AIC=1137.348, Time=0.06 sec
 ARIMA(1,0,2)(0,0,0)[0] intercept    : AIC=1119.792, Time=0.24 sec
 ARIMA(3,0,0)(0,0,0)[0] intercept    : AIC=1125.676, Time=0.12 sec
 ARIMA(3,0,2)(0,0,0)[0] intercept    : AIC=1118.191, Time=0.80 sec

Best model:  ARIMA(2,0,1)(0,0,0)[0] intercept
Total fit time: 4.024 seconds
Performing stepwise search to minimize aic

/usr/local/lib/python3.10/dist-packages/statsmodels/tsa/base/
tsa_model.py:836: ValueWarning: No supported index is available.
Prediction results will be given with an integer index beginning at
`start`.
  return get_prediction_index(
/usr/local/lib/python3.10/dist-packages/statsmodels/tsa/base/tsa_model
.py:836: FutureWarning: No supported index is available. In the next
```

```
version, calling this method in a model without a supported index will
result in an exception.
   return get_prediction_index(

 ARIMA(1,1,1)(0,0,0)[0] intercept   : AIC=251.540, Time=0.20 sec
 ARIMA(0,1,0)(0,0,0)[0] intercept   : AIC=402.587, Time=0.06 sec
 ARIMA(1,1,0)(0,0,0)[0] intercept   : AIC=316.892, Time=0.06 sec
 ARIMA(0,1,1)(0,0,0)[0] intercept   : AIC=inf, Time=0.21 sec
 ARIMA(0,1,0)(0,0,0)[0]             : AIC=400.587, Time=0.03 sec
 ARIMA(2,1,1)(0,0,0)[0] intercept   : AIC=253.438, Time=0.32 sec
 ARIMA(1,1,2)(0,0,0)[0] intercept   : AIC=253.492, Time=0.30 sec
 ARIMA(0,1,2)(0,0,0)[0] intercept   : AIC=252.455, Time=0.16 sec
 ARIMA(2,1,0)(0,0,0)[0] intercept   : AIC=285.005, Time=0.10 sec
 ARIMA(2,1,2)(0,0,0)[0] intercept   : AIC=255.534, Time=0.29 sec
 ARIMA(1,1,1)(0,0,0)[0]             : AIC=250.105, Time=0.07 sec
 ARIMA(0,1,1)(0,0,0)[0]             : AIC=255.939, Time=0.23 sec
 ARIMA(1,1,0)(0,0,0)[0]             : AIC=314.892, Time=0.03 sec
 ARIMA(2,1,1)(0,0,0)[0]             : AIC=252.073, Time=0.11 sec
 ARIMA(1,1,2)(0,0,0)[0]             : AIC=252.089, Time=0.15 sec
 ARIMA(0,1,2)(0,0,0)[0]             : AIC=250.971, Time=0.07 sec
 ARIMA(2,1,0)(0,0,0)[0]             : AIC=283.008, Time=0.04 sec
 ARIMA(2,1,2)(0,0,0)[0]             : AIC=254.076, Time=0.29 sec

Best model:  ARIMA(1,1,1)(0,0,0)[0]
Total fit time: 2.736 seconds
Warning: Invalid prediction range for item B0BNL2Z6N7. Skipping
forecast.
Performing stepwise search to minimize aic
 ARIMA(1,0,1)(0,0,0)[0]             : AIC=709.507, Time=0.09 sec
 ARIMA(0,0,0)(0,0,0)[0]             : AIC=762.002, Time=0.02 sec
 ARIMA(1,0,0)(0,0,0)[0]             : AIC=717.231, Time=0.03 sec
 ARIMA(0,0,1)(0,0,0)[0]             : AIC=725.795, Time=0.05 sec
 ARIMA(2,0,1)(0,0,0)[0]             : AIC=705.945, Time=0.24 sec
 ARIMA(2,0,0)(0,0,0)[0]             : AIC=716.929, Time=0.05 sec
 ARIMA(3,0,1)(0,0,0)[0]             : AIC=708.224, Time=0.17 sec
 ARIMA(2,0,2)(0,0,0)[0]             : AIC=703.310, Time=0.42 sec
 ARIMA(1,0,2)(0,0,0)[0]             : AIC=706.593, Time=0.96 sec
 ARIMA(3,0,2)(0,0,0)[0]             : AIC=704.960, Time=1.05 sec
 ARIMA(2,0,3)(0,0,0)[0]             : AIC=704.991, Time=0.46 sec
 ARIMA(1,0,3)(0,0,0)[0]             : AIC=707.852, Time=1.53 sec
 ARIMA(3,0,3)(0,0,0)[0]             : AIC=704.051, Time=0.62 sec
 ARIMA(2,0,2)(0,0,0)[0] intercept   : AIC=697.448, Time=0.63 sec
 ARIMA(1,0,2)(0,0,0)[0] intercept   : AIC=701.529, Time=0.27 sec
 ARIMA(2,0,1)(0,0,0)[0] intercept   : AIC=inf, Time=0.61 sec
 ARIMA(3,0,2)(0,0,0)[0] intercept   : AIC=701.986, Time=0.54 sec
 ARIMA(2,0,3)(0,0,0)[0] intercept   : AIC=699.399, Time=0.36 sec
 ARIMA(1,0,1)(0,0,0)[0] intercept   : AIC=702.381, Time=0.20 sec
 ARIMA(1,0,3)(0,0,0)[0] intercept   : AIC=701.729, Time=0.23 sec
 ARIMA(3,0,1)(0,0,0)[0] intercept   : AIC=702.373, Time=0.37 sec
 ARIMA(3,0,3)(0,0,0)[0] intercept   : AIC=701.398, Time=0.73 sec
```

```
Best model:  ARIMA(2,0,2)(0,0,0)[0] intercept
Total fit time: 9.707 seconds
Performing stepwise search to minimize aic
 ARIMA(1,0,1)(0,0,0)[0]                : AIC=106.362, Time=0.09 sec
 ARIMA(0,0,0)(0,0,0)[0]                : AIC=119.715, Time=0.03 sec
 ARIMA(1,0,0)(0,0,0)[0]                : AIC=119.215, Time=0.02 sec

/usr/local/lib/python3.10/dist-packages/statsmodels/tsa/base/
tsa_model.py:836: ValueWarning: No supported index is available.
Prediction results will be given with an integer index beginning at
`start`.
  return get_prediction_index(
/usr/local/lib/python3.10/dist-packages/statsmodels/tsa/base/tsa_model
.py:836: FutureWarning: No supported index is available. In the next
version, calling this method in a model without a supported index will
result in an exception.
  return get_prediction_index(

 ARIMA(0,0,1)(0,0,0)[0]                : AIC=119.391, Time=0.05 sec
 ARIMA(2,0,1)(0,0,0)[0]                : AIC=106.640, Time=0.12 sec
 ARIMA(1,0,2)(0,0,0)[0]                : AIC=104.632, Time=0.09 sec
 ARIMA(0,0,2)(0,0,0)[0]                : AIC=121.390, Time=0.04 sec
 ARIMA(2,0,2)(0,0,0)[0]                : AIC=110.106, Time=0.22 sec
 ARIMA(1,0,3)(0,0,0)[0]                : AIC=101.716, Time=0.11 sec
 ARIMA(0,0,3)(0,0,0)[0]                : AIC=110.972, Time=0.06 sec
 ARIMA(2,0,3)(0,0,0)[0]                : AIC=103.330, Time=0.15 sec
 ARIMA(1,0,3)(0,0,0)[0] intercept      : AIC=100.983, Time=0.32 sec
 ARIMA(0,0,3)(0,0,0)[0] intercept      : AIC=102.389, Time=0.16 sec
 ARIMA(1,0,2)(0,0,0)[0] intercept      : AIC=104.185, Time=0.26 sec
 ARIMA(2,0,3)(0,0,0)[0] intercept      : AIC=102.687, Time=0.45 sec
 ARIMA(0,0,2)(0,0,0)[0] intercept      : AIC=108.836, Time=0.07 sec
 ARIMA(2,0,2)(0,0,0)[0] intercept      : AIC=103.831, Time=0.42 sec

Best model:  ARIMA(1,0,3)(0,0,0)[0] intercept
Total fit time: 2.685 seconds
Warning: Invalid prediction range for item B0BNL424DV. Skipping
forecast.
Performing stepwise search to minimize aic
 ARIMA(1,0,1)(0,0,0)[0]                : AIC=3228.602, Time=0.10 sec
 ARIMA(0,0,0)(0,0,0)[0]                : AIC=4189.670, Time=0.02 sec
 ARIMA(1,0,0)(0,0,0)[0]                : AIC=3227.633, Time=0.05 sec
 ARIMA(0,0,1)(0,0,0)[0]                : AIC=3733.073, Time=0.06 sec
 ARIMA(2,0,0)(0,0,0)[0]                : AIC=3228.887, Time=0.06 sec
 ARIMA(2,0,1)(0,0,0)[0]                : AIC=3226.914, Time=0.20 sec
 ARIMA(3,0,1)(0,0,0)[0]                : AIC=3223.048, Time=0.24 sec
 ARIMA(3,0,0)(0,0,0)[0]                : AIC=3222.331, Time=0.12 sec
 ARIMA(3,0,0)(0,0,0)[0] intercept      : AIC=3222.860, Time=0.32 sec

Best model:  ARIMA(3,0,0)(0,0,0)[0]
```

```
Total fit time: 1.189 seconds
Performing stepwise search to minimize aic

/usr/local/lib/python3.10/dist-packages/statsmodels/tsa/base/
tsa_model.py:836: ValueWarning: No supported index is available.
Prediction results will be given with an integer index beginning at
`start`.
  return get_prediction_index(
/usr/local/lib/python3.10/dist-packages/statsmodels/tsa/base/tsa_model
.py:836: FutureWarning: No supported index is available. In the next
version, calling this method in a model without a supported index will
result in an exception.
  return get_prediction_index(

 ARIMA(1,1,1)(0,0,0)[0] intercept   : AIC=inf, Time=0.44 sec
 ARIMA(0,1,0)(0,0,0)[0] intercept   : AIC=344.815, Time=0.04 sec
 ARIMA(1,1,0)(0,0,0)[0] intercept   : AIC=288.163, Time=0.06 sec
 ARIMA(0,1,1)(0,0,0)[0] intercept   : AIC=249.541, Time=0.12 sec
 ARIMA(0,1,0)(0,0,0)[0]             : AIC=342.815, Time=0.02 sec
 ARIMA(0,1,2)(0,0,0)[0] intercept   : AIC=250.778, Time=0.20 sec
 ARIMA(1,1,2)(0,0,0)[0] intercept   : AIC=253.213, Time=0.42 sec
 ARIMA(0,1,1)(0,0,0)[0]             : AIC=247.734, Time=0.07 sec
 ARIMA(1,1,1)(0,0,0)[0]             : AIC=248.811, Time=0.21 sec
 ARIMA(0,1,2)(0,0,0)[0]             : AIC=249.055, Time=0.25 sec
 ARIMA(1,1,0)(0,0,0)[0]             : AIC=286.163, Time=0.04 sec
 ARIMA(1,1,2)(0,0,0)[0]             : AIC=251.397, Time=1.72 sec

Best model:  ARIMA(0,1,1)(0,0,0)[0]
Total fit time: 3.622 seconds
Warning: Invalid prediction range for item B0BNL5FVMF. Skipping
forecast.
Performing stepwise search to minimize aic
 ARIMA(1,1,1)(0,0,0)[0] intercept   : AIC=693.968, Time=0.46 sec
 ARIMA(0,1,0)(0,0,0)[0] intercept   : AIC=780.782, Time=0.05 sec
 ARIMA(1,1,0)(0,0,0)[0] intercept   : AIC=723.105, Time=0.10 sec
 ARIMA(0,1,1)(0,0,0)[0] intercept   : AIC=692.157, Time=1.30 sec
 ARIMA(0,1,0)(0,0,0)[0]             : AIC=778.782, Time=0.03 sec
 ARIMA(0,1,2)(0,0,0)[0] intercept   : AIC=693.986, Time=0.13 sec
 ARIMA(1,1,2)(0,0,0)[0] intercept   : AIC=695.502, Time=0.34 sec
 ARIMA(0,1,1)(0,0,0)[0]             : AIC=690.157, Time=0.05 sec
 ARIMA(1,1,1)(0,0,0)[0]             : AIC=691.969, Time=0.06 sec
 ARIMA(0,1,2)(0,0,0)[0]             : AIC=691.987, Time=0.06 sec
 ARIMA(1,1,0)(0,0,0)[0]             : AIC=721.105, Time=0.04 sec
 ARIMA(1,1,2)(0,0,0)[0]             : AIC=693.503, Time=0.15 sec

Best model:  ARIMA(0,1,1)(0,0,0)[0]
Total fit time: 2.798 seconds
Performing stepwise search to minimize aic
```

```
/usr/local/lib/python3.10/dist-packages/statsmodels/tsa/base/
tsa_model.py:836: ValueWarning: No supported index is available.
Prediction results will be given with an integer index beginning at
`start`.
  return get_prediction_index(
/usr/local/lib/python3.10/dist-packages/statsmodels/tsa/base/tsa_model
.py:836: FutureWarning: No supported index is available. In the next
version, calling this method in a model without a supported index will
result in an exception.
  return get_prediction_index(

 ARIMA(1,0,1)(0,0,0)[0]             : AIC=1033.325, Time=0.12 sec
 ARIMA(0,0,0)(0,0,0)[0]             : AIC=1113.401, Time=0.02 sec
 ARIMA(1,0,0)(0,0,0)[0]             : AIC=1083.643, Time=0.05 sec
 ARIMA(0,0,1)(0,0,0)[0]             : AIC=1093.317, Time=0.05 sec
 ARIMA(2,0,1)(0,0,0)[0]             : AIC=1035.294, Time=0.18 sec
 ARIMA(1,0,2)(0,0,0)[0]             : AIC=1035.296, Time=0.21 sec
 ARIMA(0,0,2)(0,0,0)[0]             : AIC=1081.517, Time=0.06 sec
 ARIMA(2,0,0)(0,0,0)[0]             : AIC=1066.892, Time=0.05 sec
 ARIMA(2,0,2)(0,0,0)[0]             : AIC=1037.121, Time=0.27 sec
 ARIMA(1,0,1)(0,0,0)[0] intercept   : AIC=1028.995, Time=0.40 sec
 ARIMA(0,0,1)(0,0,0)[0] intercept   : AIC=1043.330, Time=0.08 sec
 ARIMA(1,0,0)(0,0,0)[0] intercept   : AIC=1041.854, Time=0.09 sec
 ARIMA(2,0,1)(0,0,0)[0] intercept   : AIC=1030.992, Time=0.40 sec
 ARIMA(1,0,2)(0,0,0)[0] intercept   : AIC=1030.992, Time=0.40 sec
 ARIMA(0,0,0)(0,0,0)[0] intercept   : AIC=1047.411, Time=0.03 sec
 ARIMA(0,0,2)(0,0,0)[0] intercept   : AIC=1040.642, Time=0.11 sec
 ARIMA(2,0,0)(0,0,0)[0] intercept   : AIC=1038.132, Time=0.13 sec
 ARIMA(2,0,2)(0,0,0)[0] intercept   : AIC=1032.844, Time=0.95 sec

Best model:  ARIMA(1,0,1)(0,0,0)[0] intercept
Total fit time: 3.609 seconds
Performing stepwise search to minimize aic

/usr/local/lib/python3.10/dist-packages/statsmodels/tsa/base/
tsa_model.py:836: ValueWarning: No supported index is available.
Prediction results will be given with an integer index beginning at
`start`.
  return get_prediction_index(
/usr/local/lib/python3.10/dist-packages/statsmodels/tsa/base/tsa_model
.py:836: FutureWarning: No supported index is available. In the next
version, calling this method in a model without a supported index will
result in an exception.
  return get_prediction_index(

 ARIMA(1,0,1)(0,0,0)[0]             : AIC=inf, Time=0.20 sec
 ARIMA(0,0,0)(0,0,0)[0]             : AIC=271.306, Time=0.04 sec
 ARIMA(1,0,0)(0,0,0)[0]             : AIC=269.271, Time=0.03 sec
 ARIMA(0,0,1)(0,0,0)[0]             : AIC=270.567, Time=0.03 sec
 ARIMA(2,0,0)(0,0,0)[0]             : AIC=259.028, Time=0.10 sec
```

```
ARIMA(3,0,0)(0,0,0)[0]                   : AIC=260.246, Time=0.07 sec
ARIMA(2,0,1)(0,0,0)[0]                   : AIC=246.241, Time=0.29 sec
ARIMA(3,0,1)(0,0,0)[0]                   : AIC=inf, Time=0.48 sec
ARIMA(2,0,2)(0,0,0)[0]                   : AIC=244.102, Time=0.24 sec
ARIMA(1,0,2)(0,0,0)[0]                   : AIC=246.255, Time=0.30 sec
ARIMA(3,0,2)(0,0,0)[0]                   : AIC=inf, Time=0.59 sec
ARIMA(2,0,3)(0,0,0)[0]                   : AIC=inf, Time=0.54 sec
ARIMA(1,0,3)(0,0,0)[0]                   : AIC=inf, Time=0.45 sec
ARIMA(3,0,3)(0,0,0)[0]                   : AIC=inf, Time=0.62 sec
ARIMA(2,0,2)(0,0,0)[0] intercept   : AIC=238.818, Time=0.76 sec
ARIMA(1,0,2)(0,0,0)[0] intercept   : AIC=237.569, Time=0.29 sec
ARIMA(0,0,2)(0,0,0)[0] intercept   : AIC=239.450, Time=0.23 sec
ARIMA(1,0,1)(0,0,0)[0] intercept   : AIC=237.419, Time=0.65 sec
ARIMA(0,0,1)(0,0,0)[0] intercept   : AIC=239.645, Time=0.36 sec
ARIMA(1,0,0)(0,0,0)[0] intercept   : AIC=239.630, Time=0.12 sec
ARIMA(2,0,1)(0,0,0)[0] intercept   : AIC=237.597, Time=1.93 sec
ARIMA(0,0,0)(0,0,0)[0] intercept   : AIC=237.710, Time=0.12 sec
ARIMA(2,0,0)(0,0,0)[0] intercept   : AIC=238.840, Time=1.00 sec

Best model:  ARIMA(1,0,1)(0,0,0)[0] intercept
Total fit time: 9.508 seconds
Performing stepwise search to minimize aic
```

/usr/local/lib/python3.10/dist-packages/statsmodels/tsa/base/
tsa_model.py:836: ValueWarning: No supported index is available.
Prediction results will be given with an integer index beginning at
`start`.
  return get_prediction_index(
/usr/local/lib/python3.10/dist-packages/statsmodels/tsa/base/tsa_model
.py:836: FutureWarning: No supported index is available. In the next
version, calling this method in a model without a supported index will
result in an exception.
  return get_prediction_index(

```
ARIMA(1,1,1)(0,0,0)[0] intercept   : AIC=28.851, Time=0.18 sec
ARIMA(0,1,0)(0,0,0)[0] intercept   : AIC=69.356, Time=0.03 sec
ARIMA(1,1,0)(0,0,0)[0] intercept   : AIC=34.228, Time=0.08 sec
ARIMA(0,1,1)(0,0,0)[0] intercept   : AIC=inf, Time=0.24 sec
ARIMA(0,1,0)(0,0,0)[0]                   : AIC=67.356, Time=0.02 sec
ARIMA(2,1,1)(0,0,0)[0] intercept   : AIC=inf, Time=0.25 sec
ARIMA(1,1,2)(0,0,0)[0] intercept   : AIC=30.674, Time=0.28 sec
ARIMA(0,1,2)(0,0,0)[0] intercept   : AIC=32.908, Time=0.09 sec
ARIMA(2,1,0)(0,0,0)[0] intercept   : AIC=31.022, Time=0.06 sec
ARIMA(2,1,2)(0,0,0)[0] intercept   : AIC=30.758, Time=0.33 sec
ARIMA(1,1,1)(0,0,0)[0]                   : AIC=27.504, Time=0.05 sec
ARIMA(0,1,1)(0,0,0)[0]                   : AIC=36.163, Time=0.04 sec
ARIMA(1,1,0)(0,0,0)[0]                   : AIC=32.368, Time=0.03 sec
ARIMA(2,1,1)(0,0,0)[0]                   : AIC=29.412, Time=0.07 sec
ARIMA(1,1,2)(0,0,0)[0]                   : AIC=29.448, Time=0.08 sec
ARIMA(0,1,2)(0,0,0)[0]                   : AIC=31.226, Time=0.07 sec
```

```
 ARIMA(2,1,0)(0,0,0)[0]              : AIC=29.311, Time=0.06 sec
 ARIMA(2,1,2)(0,0,0)[0]              : AIC=31.093, Time=0.35 sec

Best model:  ARIMA(1,1,1)(0,0,0)[0]
Total fit time: 2.344 seconds
Performing stepwise search to minimize aic
 ARIMA(1,0,1)(0,0,0)[0]              : AIC=61.253, Time=0.09 sec
 ARIMA(0,0,0)(0,0,0)[0]              : AIC=64.753, Time=0.03 sec
 ARIMA(1,0,0)(0,0,0)[0]              : AIC=66.100, Time=0.03 sec

/usr/local/lib/python3.10/dist-packages/statsmodels/tsa/base/
tsa_model.py:836: ValueWarning: No supported index is available.
Prediction results will be given with an integer index beginning at
`start`.
  return get_prediction_index(
/usr/local/lib/python3.10/dist-packages/statsmodels/tsa/base/tsa_model
.py:836: FutureWarning: No supported index is available. In the next
version, calling this method in a model without a supported index will
result in an exception.
  return get_prediction_index(

 ARIMA(0,0,1)(0,0,0)[0]              : AIC=66.190, Time=0.06 sec
 ARIMA(2,0,1)(0,0,0)[0]              : AIC=62.925, Time=0.12 sec
 ARIMA(1,0,2)(0,0,0)[0]              : AIC=62.764, Time=0.12 sec
 ARIMA(0,0,2)(0,0,0)[0]              : AIC=67.957, Time=0.03 sec
 ARIMA(2,0,0)(0,0,0)[0]              : AIC=67.568, Time=0.03 sec
 ARIMA(2,0,2)(0,0,0)[0]              : AIC=inf, Time=0.27 sec
 ARIMA(1,0,1)(0,0,0)[0] intercept   : AIC=59.569, Time=0.08 sec
 ARIMA(0,0,1)(0,0,0)[0] intercept   : AIC=57.608, Time=0.04 sec
 ARIMA(0,0,0)(0,0,0)[0] intercept   : AIC=55.909, Time=0.04 sec
 ARIMA(1,0,0)(0,0,0)[0] intercept   : AIC=57.646, Time=0.05 sec

Best model:  ARIMA(0,0,0)(0,0,0)[0] intercept
Total fit time: 1.009 seconds
Warning: Invalid prediction range for item B0BNL68VZG. Skipping
forecast.
Performing stepwise search to minimize aic
 ARIMA(1,0,1)(0,0,0)[0]              : AIC=754.113, Time=0.07 sec
 ARIMA(0,0,0)(0,0,0)[0]              : AIC=799.861, Time=0.02 sec
 ARIMA(1,0,0)(0,0,0)[0]              : AIC=752.459, Time=0.03 sec
 ARIMA(0,0,1)(0,0,0)[0]              : AIC=761.125, Time=0.05 sec
 ARIMA(2,0,0)(0,0,0)[0]              : AIC=754.151, Time=0.06 sec
 ARIMA(2,0,1)(0,0,0)[0]              : AIC=inf, Time=0.46 sec
 ARIMA(1,0,0)(0,0,0)[0] intercept   : AIC=742.036, Time=0.07 sec
 ARIMA(0,0,0)(0,0,0)[0] intercept   : AIC=774.542, Time=0.06 sec
 ARIMA(2,0,0)(0,0,0)[0] intercept   : AIC=744.001, Time=0.09 sec
 ARIMA(1,0,1)(0,0,0)[0] intercept   : AIC=744.006, Time=0.11 sec
 ARIMA(0,0,1)(0,0,0)[0] intercept   : AIC=745.511, Time=0.07 sec
 ARIMA(2,0,1)(0,0,0)[0] intercept   : AIC=inf, Time=0.65 sec
```

```
Best model:  ARIMA(1,0,0)(0,0,0)[0] intercept
Total fit time: 1.757 seconds
Warning: Invalid prediction range for item B0BNLS6YPG. Skipping
forecast.
Performing stepwise search to minimize aic
 ARIMA(1,0,1)(0,0,0)[0]                     : AIC=3716.349, Time=0.09 sec
 ARIMA(0,0,0)(0,0,0)[0]                     : AIC=3929.002, Time=0.02 sec
 ARIMA(1,0,0)(0,0,0)[0]                     : AIC=3761.167, Time=0.06 sec
 ARIMA(0,0,1)(0,0,0)[0]                     : AIC=3726.681, Time=0.06 sec
 ARIMA(2,0,1)(0,0,0)[0]                     : AIC=3718.115, Time=0.13 sec
 ARIMA(1,0,2)(0,0,0)[0]                     : AIC=3714.416, Time=0.18 sec
 ARIMA(0,0,2)(0,0,0)[0]                     : AIC=3714.002, Time=0.10 sec
 ARIMA(0,0,3)(0,0,0)[0]                     : AIC=3713.241, Time=0.12 sec
 ARIMA(1,0,3)(0,0,0)[0]                     : AIC=3713.017, Time=0.36 sec
 ARIMA(2,0,3)(0,0,0)[0]                     : AIC=3709.600, Time=0.39 sec
 ARIMA(2,0,2)(0,0,0)[0]                     : AIC=3715.043, Time=0.30 sec
 ARIMA(3,0,3)(0,0,0)[0]                     : AIC=3698.087, Time=0.29 sec
 ARIMA(3,0,2)(0,0,0)[0]                     : AIC=3697.243, Time=0.19 sec
 ARIMA(3,0,1)(0,0,0)[0]                     : AIC=3697.327, Time=0.20 sec
 ARIMA(3,0,2)(0,0,0)[0] intercept   : AIC=3695.377, Time=0.76 sec
 ARIMA(2,0,2)(0,0,0)[0] intercept   : AIC=3713.822, Time=0.59 sec
 ARIMA(3,0,1)(0,0,0)[0] intercept   : AIC=3695.849, Time=0.49 sec
 ARIMA(3,0,3)(0,0,0)[0] intercept   : AIC=3696.415, Time=1.48 sec
 ARIMA(2,0,1)(0,0,0)[0] intercept   : AIC=3714.029, Time=3.19 sec
 ARIMA(2,0,3)(0,0,0)[0] intercept   : AIC=3708.584, Time=0.95 sec

Best model:  ARIMA(3,0,2)(0,0,0)[0] intercept
Total fit time: 9.980 seconds
Performing stepwise search to minimize aic

/usr/local/lib/python3.10/dist-packages/statsmodels/tsa/base/
tsa_model.py:836: ValueWarning: No supported index is available.
Prediction results will be given with an integer index beginning at
`start`.
  return get_prediction_index(
/usr/local/lib/python3.10/dist-packages/statsmodels/tsa/base/tsa_model
.py:836: FutureWarning: No supported index is available. In the next
version, calling this method in a model without a supported index will
result in an exception.
  return get_prediction_index(

 ARIMA(1,1,1)(0,0,0)[0] intercept   : AIC=3618.678, Time=0.30 sec
 ARIMA(0,1,0)(0,0,0)[0] intercept   : AIC=3746.412, Time=0.04 sec
 ARIMA(1,1,0)(0,0,0)[0] intercept   : AIC=3732.446, Time=0.09 sec
 ARIMA(0,1,1)(0,0,0)[0] intercept   : AIC=3686.646, Time=0.14 sec
 ARIMA(0,1,0)(0,0,0)[0]                     : AIC=3744.412, Time=0.03 sec
 ARIMA(2,1,1)(0,0,0)[0] intercept   : AIC=3613.423, Time=0.44 sec
 ARIMA(2,1,0)(0,0,0)[0] intercept   : AIC=3663.186, Time=0.18 sec
 ARIMA(3,1,1)(0,0,0)[0] intercept   : AIC=3603.380, Time=0.64 sec
 ARIMA(3,1,0)(0,0,0)[0] intercept   : AIC=3660.554, Time=0.20 sec
```

```
 ARIMA(3,1,2)(0,0,0)[0] intercept   : AIC=3600.098, Time=0.63 sec
 ARIMA(2,1,2)(0,0,0)[0] intercept   : AIC=3599.903, Time=0.43 sec
 ARIMA(1,1,2)(0,0,0)[0] intercept   : AIC=3601.802, Time=0.44 sec
 ARIMA(2,1,3)(0,0,0)[0] intercept   : AIC=3602.685, Time=1.07 sec
 ARIMA(1,1,3)(0,0,0)[0] intercept   : AIC=3602.993, Time=0.56 sec
 ARIMA(3,1,3)(0,0,0)[0] intercept   : AIC=3594.849, Time=1.10 sec
 ARIMA(3,1,3)(0,0,0)[0]             : AIC=3592.849, Time=0.92 sec
 ARIMA(2,1,3)(0,0,0)[0]             : AIC=3600.685, Time=0.58 sec
 ARIMA(3,1,2)(0,0,0)[0]             : AIC=3598.098, Time=0.40 sec
 ARIMA(2,1,2)(0,0,0)[0]             : AIC=3597.904, Time=0.28 sec

Best model:  ARIMA(3,1,3)(0,0,0)[0]
Total fit time: 8.506 seconds
Performing stepwise search to minimize aic
 ARIMA(1,0,1)(0,0,0)[0]             : AIC=4456.200, Time=0.11 sec
 ARIMA(0,0,0)(0,0,0)[0]             : AIC=4651.853, Time=0.03 sec
```

/usr/local/lib/python3.10/dist-packages/statsmodels/tsa/base/
tsa_model.py:836: ValueWarning: No supported index is available.
Prediction results will be given with an integer index beginning at
`start`.
  return get_prediction_index(
/usr/local/lib/python3.10/dist-packages/statsmodels/tsa/base/tsa_model
.py:836: FutureWarning: No supported index is available. In the next
version, calling this method in a model without a supported index will
result in an exception.
  return get_prediction_index(

```
 ARIMA(1,0,0)(0,0,0)[0]             : AIC=4525.775, Time=0.08 sec
 ARIMA(0,0,1)(0,0,0)[0]             : AIC=4454.277, Time=0.08 sec
 ARIMA(0,0,2)(0,0,0)[0]             : AIC=4456.203, Time=0.10 sec
 ARIMA(1,0,2)(0,0,0)[0]             : AIC=4456.167, Time=0.38 sec
 ARIMA(0,0,1)(0,0,0)[0] intercept   : AIC=4452.449, Time=0.26 sec
 ARIMA(0,0,0)(0,0,0)[0] intercept   : AIC=4646.449, Time=0.05 sec
 ARIMA(1,0,1)(0,0,0)[0] intercept   : AIC=4454.438, Time=1.74 sec
 ARIMA(0,0,2)(0,0,0)[0] intercept   : AIC=4454.438, Time=0.72 sec
 ARIMA(1,0,0)(0,0,0)[0] intercept   : AIC=4525.191, Time=0.14 sec
 ARIMA(1,0,2)(0,0,0)[0] intercept   : AIC=4455.968, Time=1.85 sec

Best model:  ARIMA(0,0,1)(0,0,0)[0] intercept
Total fit time: 5.545 seconds
Performing stepwise search to minimize aic
```

/usr/local/lib/python3.10/dist-packages/statsmodels/tsa/base/
tsa_model.py:836: ValueWarning: No supported index is available.
Prediction results will be given with an integer index beginning at
`start`.
  return get_prediction_index(
/usr/local/lib/python3.10/dist-packages/statsmodels/tsa/base/tsa_model
.py:836: FutureWarning: No supported index is available. In the next

```
version, calling this method in a model without a supported index will
result in an exception.
  return get_prediction_index(

 ARIMA(1,1,1)(0,0,0)[0] intercept   : AIC=595.128, Time=0.22 sec
 ARIMA(0,1,0)(0,0,0)[0] intercept   : AIC=708.767, Time=0.07 sec
 ARIMA(1,1,0)(0,0,0)[0] intercept   : AIC=650.296, Time=0.05 sec
 ARIMA(0,1,1)(0,0,0)[0] intercept   : AIC=593.364, Time=0.13 sec
 ARIMA(0,1,0)(0,0,0)[0]             : AIC=706.767, Time=0.03 sec
 ARIMA(0,1,2)(0,0,0)[0] intercept   : AIC=595.111, Time=0.21 sec
 ARIMA(1,1,2)(0,0,0)[0] intercept   : AIC=594.988, Time=0.37 sec
 ARIMA(0,1,1)(0,0,0)[0]             : AIC=591.380, Time=0.05 sec
 ARIMA(1,1,1)(0,0,0)[0]             : AIC=593.142, Time=0.07 sec
 ARIMA(0,1,2)(0,0,0)[0]             : AIC=593.126, Time=0.07 sec
 ARIMA(1,1,0)(0,0,0)[0]             : AIC=648.298, Time=0.04 sec
 ARIMA(1,1,2)(0,0,0)[0]             : AIC=593.003, Time=0.17 sec

Best model:  ARIMA(0,1,1)(0,0,0)[0]
Total fit time: 1.505 seconds
Warning: Invalid prediction range for item B0BRCX2KDM. Skipping
forecast.
Performing stepwise search to minimize aic
 ARIMA(1,0,1)(0,0,0)[0]             : AIC=3925.452, Time=0.09 sec
 ARIMA(0,0,0)(0,0,0)[0]             : AIC=4493.958, Time=0.02 sec
 ARIMA(1,0,0)(0,0,0)[0]             : AIC=3959.918, Time=0.05 sec
 ARIMA(0,0,1)(0,0,0)[0]             : AIC=4264.785, Time=0.08 sec
 ARIMA(2,0,1)(0,0,0)[0]             : AIC=3882.195, Time=0.22 sec
 ARIMA(2,0,0)(0,0,0)[0]             : AIC=3906.836, Time=0.08 sec
 ARIMA(3,0,1)(0,0,0)[0]             : AIC=3875.023, Time=0.17 sec
 ARIMA(3,0,0)(0,0,0)[0]             : AIC=3879.563, Time=0.11 sec
 ARIMA(3,0,2)(0,0,0)[0]             : AIC=3831.454, Time=0.30 sec
 ARIMA(2,0,2)(0,0,0)[0]             : AIC=3853.576, Time=0.20 sec
 ARIMA(3,0,3)(0,0,0)[0]             : AIC=3832.497, Time=0.72 sec
 ARIMA(2,0,3)(0,0,0)[0]             : AIC=3831.992, Time=0.33 sec
 ARIMA(3,0,2)(0,0,0)[0] intercept   : AIC=3824.006, Time=0.92 sec
 ARIMA(2,0,2)(0,0,0)[0] intercept   : AIC=3843.099, Time=0.51 sec
 ARIMA(3,0,1)(0,0,0)[0] intercept   : AIC=3866.910, Time=0.52 sec
 ARIMA(3,0,3)(0,0,0)[0] intercept   : AIC=3825.956, Time=1.42 sec
 ARIMA(2,0,1)(0,0,0)[0] intercept   : AIC=3876.762, Time=0.36 sec
 ARIMA(2,0,3)(0,0,0)[0] intercept   : AIC=3827.804, Time=0.70 sec

Best model:  ARIMA(3,0,2)(0,0,0)[0] intercept
Total fit time: 6.836 seconds
Performing stepwise search to minimize aic
 ARIMA(1,0,1)(0,0,0)[0]             : AIC=1204.930, Time=0.06 sec
 ARIMA(0,0,0)(0,0,0)[0]             : AIC=1272.039, Time=0.02 sec
 ARIMA(1,0,0)(0,0,0)[0]             : AIC=1214.755, Time=0.03 sec
 ARIMA(0,0,1)(0,0,0)[0]             : AIC=1202.976, Time=0.04 sec
```

```
/usr/local/lib/python3.10/dist-packages/statsmodels/tsa/base/
tsa_model.py:836: ValueWarning: No supported index is available.
Prediction results will be given with an integer index beginning at
`start`.
  return get_prediction_index(
/usr/local/lib/python3.10/dist-packages/statsmodels/tsa/base/tsa_model
.py:836: FutureWarning: No supported index is available. In the next
version, calling this method in a model without a supported index will
result in an exception.
  return get_prediction_index(

 ARIMA(0,0,2)(0,0,0)[0]              : AIC=1204.938, Time=0.08 sec
 ARIMA(1,0,2)(0,0,0)[0]              : AIC=1198.887, Time=0.26 sec
 ARIMA(2,0,2)(0,0,0)[0]              : AIC=1200.606, Time=0.32 sec
 ARIMA(1,0,3)(0,0,0)[0]              : AIC=1200.612, Time=0.28 sec
 ARIMA(0,0,3)(0,0,0)[0]              : AIC=1206.424, Time=0.08 sec
 ARIMA(2,0,1)(0,0,0)[0]              : AIC=1206.350, Time=0.27 sec
 ARIMA(2,0,3)(0,0,0)[0]              : AIC=1202.655, Time=1.84 sec
 ARIMA(1,0,2)(0,0,0)[0] intercept    : AIC=1197.549, Time=1.20 sec
 ARIMA(0,0,2)(0,0,0)[0] intercept    : AIC=1195.604, Time=1.10 sec
 ARIMA(0,0,1)(0,0,0)[0] intercept    : AIC=1193.786, Time=0.16 sec
 ARIMA(0,0,0)(0,0,0)[0] intercept    : AIC=1253.954, Time=0.02 sec
 ARIMA(1,0,1)(0,0,0)[0] intercept    : AIC=1195.595, Time=0.13 sec
 ARIMA(1,0,0)(0,0,0)[0] intercept    : AIC=1208.104, Time=0.06 sec

Best model:  ARIMA(0,0,1)(0,0,0)[0] intercept
Total fit time: 5.972 seconds
Performing stepwise search to minimize aic

/usr/local/lib/python3.10/dist-packages/statsmodels/tsa/base/
tsa_model.py:836: ValueWarning: No supported index is available.
Prediction results will be given with an integer index beginning at
`start`.
  return get_prediction_index(
/usr/local/lib/python3.10/dist-packages/statsmodels/tsa/base/tsa_model
.py:836: FutureWarning: No supported index is available. In the next
version, calling this method in a model without a supported index will
result in an exception.
  return get_prediction_index(

 ARIMA(1,0,1)(0,0,0)[0]              : AIC=1322.583, Time=0.09 sec
 ARIMA(0,0,0)(0,0,0)[0]              : AIC=1514.930, Time=0.02 sec
 ARIMA(1,0,0)(0,0,0)[0]              : AIC=1326.659, Time=0.03 sec
 ARIMA(0,0,1)(0,0,0)[0]              : AIC=1332.588, Time=0.06 sec
 ARIMA(2,0,1)(0,0,0)[0]              : AIC=1300.165, Time=0.09 sec
 ARIMA(2,0,0)(0,0,0)[0]              : AIC=1328.257, Time=0.06 sec
 ARIMA(3,0,1)(0,0,0)[0]              : AIC=1243.561, Time=0.10 sec
 ARIMA(3,0,0)(0,0,0)[0]              : AIC=1259.014, Time=0.07 sec
 ARIMA(3,0,2)(0,0,0)[0]              : AIC=1245.092, Time=0.12 sec
 ARIMA(2,0,2)(0,0,0)[0]              : AIC=1273.026, Time=0.10 sec
```

```
  ARIMA(3,0,1)(0,0,0)[0] intercept   : AIC=1244.381, Time=0.25 sec

Best model:  ARIMA(3,0,1)(0,0,0)[0]
Total fit time: 1.013 seconds
Warning: Invalid prediction range for item B0BRCY688R. Skipping
forecast.
Performing stepwise search to minimize aic
 ARIMA(1,0,1)(0,0,0)[0]                  : AIC=768.704, Time=0.16 sec
 ARIMA(0,0,0)(0,0,0)[0]                  : AIC=837.462, Time=0.05 sec
 ARIMA(1,0,0)(0,0,0)[0]                  : AIC=781.428, Time=0.03 sec
 ARIMA(0,0,1)(0,0,0)[0]                  : AIC=788.804, Time=0.04 sec
 ARIMA(2,0,1)(0,0,0)[0]                  : AIC=757.512, Time=0.27 sec
 ARIMA(2,0,0)(0,0,0)[0]                  : AIC=782.909, Time=0.04 sec
 ARIMA(3,0,1)(0,0,0)[0]                  : AIC=755.450, Time=0.25 sec
 ARIMA(3,0,0)(0,0,0)[0]                  : AIC=776.207, Time=0.06 sec
 ARIMA(3,0,2)(0,0,0)[0]                  : AIC=758.473, Time=0.43 sec
 ARIMA(2,0,2)(0,0,0)[0]                  : AIC=755.856, Time=0.24 sec
 ARIMA(3,0,1)(0,0,0)[0] intercept   : AIC=754.053, Time=0.72 sec
 ARIMA(2,0,1)(0,0,0)[0] intercept   : AIC=761.304, Time=0.26 sec
 ARIMA(3,0,0)(0,0,0)[0] intercept   : AIC=759.071, Time=0.14 sec
 ARIMA(3,0,2)(0,0,0)[0] intercept   : AIC=755.232, Time=0.87 sec
 ARIMA(2,0,0)(0,0,0)[0] intercept   : AIC=760.089, Time=0.10 sec
 ARIMA(2,0,2)(0,0,0)[0] intercept   : AIC=754.487, Time=0.72 sec

Best model:  ARIMA(3,0,1)(0,0,0)[0] intercept
Total fit time: 4.397 seconds
Performing stepwise search to minimize aic
 ARIMA(1,0,1)(0,0,0)[0]                  : AIC=4122.676, Time=0.10 sec
 ARIMA(0,0,0)(0,0,0)[0]                  : AIC=4281.652, Time=0.02 sec

/usr/local/lib/python3.10/dist-packages/statsmodels/tsa/base/
tsa_model.py:836: ValueWarning: No supported index is available.
Prediction results will be given with an integer index beginning at
`start`.
  return get_prediction_index(
/usr/local/lib/python3.10/dist-packages/statsmodels/tsa/base/tsa_model
.py:836: FutureWarning: No supported index is available. In the next
version, calling this method in a model without a supported index will
result in an exception.
  return get_prediction_index(

 ARIMA(1,0,0)(0,0,0)[0]                  : AIC=4154.674, Time=0.06 sec
 ARIMA(0,0,1)(0,0,0)[0]                  : AIC=4122.034, Time=0.06 sec
 ARIMA(0,0,2)(0,0,0)[0]                  : AIC=4122.813, Time=0.10 sec
 ARIMA(1,0,2)(0,0,0)[0]                  : AIC=4117.777, Time=0.28 sec
 ARIMA(2,0,2)(0,0,0)[0]                  : AIC=4119.615, Time=0.34 sec
 ARIMA(1,0,3)(0,0,0)[0]                  : AIC=4119.616, Time=0.33 sec
 ARIMA(0,0,3)(0,0,0)[0]                  : AIC=4124.386, Time=0.11 sec
 ARIMA(2,0,1)(0,0,0)[0]                  : AIC=4124.180, Time=0.17 sec
 ARIMA(2,0,3)(0,0,0)[0]                  : AIC=4121.689, Time=0.39 sec
```

```
 ARIMA(1,0,2)(0,0,0)[0] intercept   : AIC=4117.960, Time=0.97 sec

Best model:  ARIMA(1,0,2)(0,0,0)[0]
Total fit time: 2.965 seconds
Performing stepwise search to minimize aic

/usr/local/lib/python3.10/dist-packages/statsmodels/tsa/base/
tsa_model.py:836: ValueWarning: No supported index is available.
Prediction results will be given with an integer index beginning at
`start`.
  return get_prediction_index(
/usr/local/lib/python3.10/dist-packages/statsmodels/tsa/base/tsa_model
.py:836: FutureWarning: No supported index is available. In the next
version, calling this method in a model without a supported index will
result in an exception.
  return get_prediction_index(

 ARIMA(1,1,1)(0,0,0)[0] intercept   : AIC=3675.340, Time=0.24 sec
 ARIMA(0,1,0)(0,0,0)[0] intercept   : AIC=3869.087, Time=0.04 sec
 ARIMA(1,1,0)(0,0,0)[0] intercept   : AIC=3776.976, Time=0.09 sec
 ARIMA(0,1,1)(0,0,0)[0] intercept   : AIC=3680.435, Time=0.15 sec
 ARIMA(0,1,0)(0,0,0)[0]             : AIC=3867.087, Time=0.02 sec
 ARIMA(2,1,1)(0,0,0)[0] intercept   : AIC=3677.184, Time=0.34 sec
 ARIMA(1,1,2)(0,0,0)[0] intercept   : AIC=3676.664, Time=1.65 sec
 ARIMA(0,1,2)(0,0,0)[0] intercept   : AIC=3675.649, Time=1.01 sec
 ARIMA(2,1,0)(0,0,0)[0] intercept   : AIC=3730.303, Time=0.92 sec
 ARIMA(2,1,2)(0,0,0)[0] intercept   : AIC=3678.864, Time=1.50 sec
 ARIMA(1,1,1)(0,0,0)[0]             : AIC=3673.360, Time=0.11 sec
 ARIMA(0,1,1)(0,0,0)[0]             : AIC=3678.439, Time=0.06 sec
 ARIMA(1,1,0)(0,0,0)[0]             : AIC=3774.976, Time=0.05 sec
 ARIMA(2,1,1)(0,0,0)[0]             : AIC=3675.208, Time=0.18 sec
 ARIMA(1,1,2)(0,0,0)[0]             : AIC=3674.703, Time=0.31 sec
 ARIMA(0,1,2)(0,0,0)[0]             : AIC=3673.665, Time=0.11 sec
 ARIMA(2,1,0)(0,0,0)[0]             : AIC=3728.303, Time=0.08 sec
 ARIMA(2,1,2)(0,0,0)[0]             : AIC=3676.881, Time=0.30 sec

Best model:  ARIMA(1,1,1)(0,0,0)[0]
Total fit time: 7.196 seconds
Performing stepwise search to minimize aic
 ARIMA(1,0,1)(0,0,0)[0]             : AIC=2964.185, Time=0.12 sec
 ARIMA(0,0,0)(0,0,0)[0]             : AIC=3593.484, Time=0.02 sec

/usr/local/lib/python3.10/dist-packages/statsmodels/tsa/base/
tsa_model.py:836: ValueWarning: No supported index is available.
Prediction results will be given with an integer index beginning at
`start`.
  return get_prediction_index(
/usr/local/lib/python3.10/dist-packages/statsmodels/tsa/base/tsa_model
.py:836: FutureWarning: No supported index is available. In the next
version, calling this method in a model without a supported index will
```

```
result in an exception.
  return get_prediction_index(

 ARIMA(1,0,0)(0,0,0)[0]                    : AIC=3016.490, Time=0.05 sec
 ARIMA(0,0,1)(0,0,0)[0]                    : AIC=3310.167, Time=0.07 sec
 ARIMA(2,0,1)(0,0,0)[0]                    : AIC=2958.014, Time=0.19 sec
 ARIMA(2,0,0)(0,0,0)[0]                    : AIC=2983.790, Time=0.06 sec
 ARIMA(3,0,1)(0,0,0)[0]                    : AIC=2959.889, Time=0.23 sec
 ARIMA(2,0,2)(0,0,0)[0]                    : AIC=2959.855, Time=0.28 sec
 ARIMA(1,0,2)(0,0,0)[0]                    : AIC=2959.037, Time=0.17 sec
 ARIMA(3,0,0)(0,0,0)[0]                    : AIC=2971.496, Time=0.12 sec
 ARIMA(3,0,2)(0,0,0)[0]                    : AIC=2958.673, Time=0.42 sec
 ARIMA(2,0,1)(0,0,0)[0] intercept         : AIC=2952.684, Time=0.34 sec
 ARIMA(1,0,1)(0,0,0)[0] intercept         : AIC=2955.380, Time=0.21 sec
 ARIMA(2,0,0)(0,0,0)[0] intercept         : AIC=2966.568, Time=0.16 sec
 ARIMA(3,0,1)(0,0,0)[0] intercept         : AIC=2954.683, Time=0.62 sec
 ARIMA(2,0,2)(0,0,0)[0] intercept         : AIC=2954.683, Time=0.60 sec
 ARIMA(1,0,0)(0,0,0)[0] intercept         : AIC=2987.300, Time=0.11 sec
 ARIMA(1,0,2)(0,0,0)[0] intercept         : AIC=2952.968, Time=0.29 sec
 ARIMA(3,0,0)(0,0,0)[0] intercept         : AIC=2959.381, Time=0.29 sec
 ARIMA(3,0,2)(0,0,0)[0] intercept         : AIC=2953.579, Time=0.87 sec

Best model:  ARIMA(2,0,1)(0,0,0)[0] intercept
Total fit time: 5.270 seconds
Performing stepwise search to minimize aic
 ARIMA(1,0,1)(0,0,0)[0]                    : AIC=1051.366, Time=0.06 sec
 ARIMA(0,0,0)(0,0,0)[0]                    : AIC=1217.544, Time=0.02 sec
 ARIMA(1,0,0)(0,0,0)[0]                    : AIC=1050.227, Time=0.03 sec
 ARIMA(0,0,1)(0,0,0)[0]                    : AIC=1089.914, Time=0.04 sec

/usr/local/lib/python3.10/dist-packages/statsmodels/tsa/base/
tsa_model.py:836: ValueWarning: No supported index is available.
Prediction results will be given with an integer index beginning at
`start`.
  return get_prediction_index(
/usr/local/lib/python3.10/dist-packages/statsmodels/tsa/base/tsa_model
.py:836: FutureWarning: No supported index is available. In the next
version, calling this method in a model without a supported index will
result in an exception.
  return get_prediction_index(

 ARIMA(2,0,0)(0,0,0)[0]                    : AIC=1051.494, Time=0.08 sec
 ARIMA(2,0,1)(0,0,0)[0]                    : AIC=1051.686, Time=0.15 sec
 ARIMA(1,0,0)(0,0,0)[0] intercept         : AIC=1043.788, Time=0.07 sec
 ARIMA(0,0,0)(0,0,0)[0] intercept         : AIC=1182.010, Time=0.02 sec
 ARIMA(2,0,0)(0,0,0)[0] intercept         : AIC=1043.915, Time=0.09 sec
 ARIMA(1,0,1)(0,0,0)[0] intercept         : AIC=1043.794, Time=0.14 sec
 ARIMA(0,0,1)(0,0,0)[0] intercept         : AIC=1069.033, Time=0.09 sec
 ARIMA(2,0,1)(0,0,0)[0] intercept         : AIC=1044.810, Time=0.32 sec
```

```
Best model:  ARIMA(1,0,0)(0,0,0)[0] intercept
Total fit time: 1.119 seconds
Performing stepwise search to minimize aic
 ARIMA(1,0,1)(0,0,0)[0]              : AIC=-9.353, Time=0.04 sec
 ARIMA(0,0,0)(0,0,0)[0]              : AIC=-13.353, Time=0.02 sec
 ARIMA(1,0,0)(0,0,0)[0]              : AIC=-11.353, Time=0.02 sec
 ARIMA(0,0,1)(0,0,0)[0]              : AIC=-11.353, Time=0.06 sec

/usr/local/lib/python3.10/dist-packages/statsmodels/tsa/base/
tsa_model.py:836: ValueWarning: No supported index is available.
Prediction results will be given with an integer index beginning at
`start`.
  return get_prediction_index(
/usr/local/lib/python3.10/dist-packages/statsmodels/tsa/base/tsa_model
.py:836: FutureWarning: No supported index is available. In the next
version, calling this method in a model without a supported index will
result in an exception.
  return get_prediction_index(

 ARIMA(0,0,0)(0,0,0)[0] intercept   : AIC=-12.371, Time=0.04 sec

Best model:  ARIMA(0,0,0)(0,0,0)[0]
Total fit time: 0.192 seconds
Warning: Invalid prediction range for item B0BNKZ3G6J. Skipping
forecast.
Performing stepwise search to minimize aic
 ARIMA(1,1,1)(0,0,0)[0] intercept   : AIC=inf, Time=0.35 sec
 ARIMA(0,1,0)(0,0,0)[0] intercept   : AIC=239.451, Time=0.04 sec
 ARIMA(1,1,0)(0,0,0)[0] intercept   : AIC=214.000, Time=0.05 sec
 ARIMA(0,1,1)(0,0,0)[0] intercept   : AIC=inf, Time=0.28 sec
 ARIMA(0,1,0)(0,0,0)[0]             : AIC=237.451, Time=0.02 sec
 ARIMA(2,1,0)(0,0,0)[0] intercept   : AIC=199.995, Time=0.07 sec
 ARIMA(3,1,0)(0,0,0)[0] intercept   : AIC=175.796, Time=0.11 sec
 ARIMA(3,1,1)(0,0,0)[0] intercept   : AIC=152.630, Time=0.21 sec
 ARIMA(2,1,1)(0,0,0)[0] intercept   : AIC=156.948, Time=0.27 sec
 ARIMA(3,1,2)(0,0,0)[0] intercept   : AIC=154.536, Time=0.89 sec
 ARIMA(2,1,2)(0,0,0)[0] intercept   : AIC=inf, Time=3.47 sec
 ARIMA(3,1,1)(0,0,0)[0]             : AIC=150.631, Time=0.10 sec
 ARIMA(2,1,1)(0,0,0)[0]             : AIC=155.011, Time=0.16 sec
 ARIMA(3,1,0)(0,0,0)[0]             : AIC=173.796, Time=0.07 sec
 ARIMA(3,1,2)(0,0,0)[0]             : AIC=152.536, Time=0.15 sec
 ARIMA(2,1,0)(0,0,0)[0]             : AIC=197.995, Time=0.04 sec
 ARIMA(2,1,2)(0,0,0)[0]             : AIC=153.938, Time=0.21 sec

Best model:  ARIMA(3,1,1)(0,0,0)[0]
Total fit time: 6.496 seconds
Warning: Invalid prediction range for item B0BNKZFCFT. Skipping
forecast.
Performing stepwise search to minimize aic
 ARIMA(1,1,1)(0,0,0)[0] intercept   : AIC=inf, Time=0.55 sec
```

```
 ARIMA(0,1,0)(0,0,0)[0] intercept   : AIC=635.407, Time=0.11 sec
 ARIMA(1,1,0)(0,0,0)[0] intercept   : AIC=562.246, Time=0.05 sec
 ARIMA(0,1,1)(0,0,0)[0] intercept   : AIC=inf, Time=0.24 sec
 ARIMA(0,1,0)(0,0,0)[0]             : AIC=633.407, Time=0.03 sec
 ARIMA(2,1,0)(0,0,0)[0] intercept   : AIC=525.641, Time=0.41 sec
 ARIMA(3,1,0)(0,0,0)[0] intercept   : AIC=505.900, Time=0.10 sec
 ARIMA(3,1,1)(0,0,0)[0] intercept   : AIC=inf, Time=0.91 sec
 ARIMA(2,1,1)(0,0,0)[0] intercept   : AIC=inf, Time=0.70 sec
 ARIMA(3,1,0)(0,0,0)[0]             : AIC=503.900, Time=0.06 sec
 ARIMA(2,1,0)(0,0,0)[0]             : AIC=523.641, Time=0.04 sec
 ARIMA(3,1,1)(0,0,0)[0]             : AIC=454.541, Time=0.21 sec
 ARIMA(2,1,1)(0,0,0)[0]             : AIC=452.559, Time=0.15 sec
 ARIMA(1,1,1)(0,0,0)[0]             : AIC=451.814, Time=0.15 sec
 ARIMA(0,1,1)(0,0,0)[0]             : AIC=451.933, Time=0.09 sec
 ARIMA(1,1,0)(0,0,0)[0]             : AIC=560.246, Time=0.03 sec
 ARIMA(1,1,2)(0,0,0)[0]             : AIC=451.132, Time=0.34 sec
 ARIMA(0,1,2)(0,0,0)[0]             : AIC=451.482, Time=0.13 sec
 ARIMA(2,1,2)(0,0,0)[0]             : AIC=454.546, Time=0.35 sec
 ARIMA(1,1,3)(0,0,0)[0]             : AIC=454.574, Time=0.51 sec
 ARIMA(0,1,3)(0,0,0)[0]             : AIC=452.576, Time=0.24 sec
 ARIMA(2,1,3)(0,0,0)[0]             : AIC=458.586, Time=0.38 sec
 ARIMA(1,1,2)(0,0,0)[0] intercept   : AIC=inf, Time=0.35 sec

Best model:  ARIMA(1,1,2)(0,0,0)[0]
Total fit time: 6.144 seconds
Warning: Invalid prediction range for item B0BNKZYZCC. Skipping
forecast.
Performing stepwise search to minimize aic
 ARIMA(1,0,1)(0,0,0)[0]             : AIC=519.836, Time=0.09 sec
 ARIMA(0,0,0)(0,0,0)[0]             : AIC=584.723, Time=0.03 sec
 ARIMA(1,0,0)(0,0,0)[0]             : AIC=548.500, Time=0.05 sec
 ARIMA(0,0,1)(0,0,0)[0]             : AIC=561.585, Time=0.05 sec
 ARIMA(2,0,1)(0,0,0)[0]             : AIC=520.427, Time=0.15 sec
 ARIMA(1,0,2)(0,0,0)[0]             : AIC=520.625, Time=0.13 sec
 ARIMA(0,0,2)(0,0,0)[0]             : AIC=544.833, Time=0.08 sec
 ARIMA(2,0,0)(0,0,0)[0]             : AIC=538.175, Time=0.05 sec
 ARIMA(2,0,2)(0,0,0)[0]             : AIC=inf, Time=0.49 sec
 ARIMA(1,0,1)(0,0,0)[0] intercept   : AIC=512.821, Time=0.18 sec
 ARIMA(0,0,1)(0,0,0)[0] intercept   : AIC=517.934, Time=0.08 sec
 ARIMA(1,0,0)(0,0,0)[0] intercept   : AIC=515.862, Time=0.06 sec
 ARIMA(2,0,1)(0,0,0)[0] intercept   : AIC=515.582, Time=0.22 sec
 ARIMA(1,0,2)(0,0,0)[0] intercept   : AIC=514.527, Time=0.29 sec
 ARIMA(0,0,0)(0,0,0)[0] intercept   : AIC=523.935, Time=0.07 sec
 ARIMA(0,0,2)(0,0,0)[0] intercept   : AIC=514.346, Time=0.09 sec
 ARIMA(2,0,0)(0,0,0)[0] intercept   : AIC=515.100, Time=0.10 sec
 ARIMA(2,0,2)(0,0,0)[0] intercept   : AIC=516.509, Time=0.60 sec

Best model:  ARIMA(1,0,1)(0,0,0)[0] intercept
Total fit time: 2.843 seconds
```

```
Warning: Invalid prediction range for item B0BNL3Y4QM. Skipping
forecast.
Performing stepwise search to minimize aic
 ARIMA(1,0,1)(0,0,0)[0]                   : AIC=166.395, Time=0.07 sec
 ARIMA(0,0,0)(0,0,0)[0]                   : AIC=180.113, Time=0.03 sec
 ARIMA(1,0,0)(0,0,0)[0]                   : AIC=172.883, Time=0.20 sec
 ARIMA(0,0,1)(0,0,0)[0]                   : AIC=173.639, Time=0.15 sec
 ARIMA(2,0,1)(0,0,0)[0]                   : AIC=168.096, Time=0.49 sec
 ARIMA(1,0,2)(0,0,0)[0]                   : AIC=167.914, Time=1.07 sec
 ARIMA(0,0,2)(0,0,0)[0]                   : AIC=175.402, Time=0.30 sec
 ARIMA(2,0,0)(0,0,0)[0]                   : AIC=174.597, Time=0.06 sec
 ARIMA(2,0,2)(0,0,0)[0]                   : AIC=169.268, Time=0.49 sec
 ARIMA(1,0,1)(0,0,0)[0] intercept   : AIC=166.225, Time=0.23 sec
 ARIMA(0,0,1)(0,0,0)[0] intercept   : AIC=164.343, Time=1.29 sec
 ARIMA(0,0,0)(0,0,0)[0] intercept   : AIC=165.876, Time=0.06 sec
 ARIMA(0,0,2)(0,0,0)[0] intercept   : AIC=166.243, Time=0.06 sec
 ARIMA(1,0,0)(0,0,0)[0] intercept   : AIC=164.628, Time=0.04 sec
 ARIMA(1,0,2)(0,0,0)[0] intercept   : AIC=166.581, Time=0.19 sec

Best model:  ARIMA(0,0,1)(0,0,0)[0] intercept
Total fit time: 4.748 seconds
Warning: Invalid prediction range for item B0BNL63RCS. Skipping
forecast.
Performing stepwise search to minimize aic
 ARIMA(1,0,1)(0,0,0)[0]                   : AIC=80.704, Time=0.11 sec
 ARIMA(0,0,0)(0,0,0)[0]                   : AIC=92.762, Time=0.03 sec
 ARIMA(1,0,0)(0,0,0)[0]                   : AIC=92.446, Time=0.04 sec
 ARIMA(0,0,1)(0,0,0)[0]                   : AIC=93.022, Time=0.04 sec
 ARIMA(2,0,1)(0,0,0)[0]                   : AIC=82.418, Time=0.27 sec
 ARIMA(1,0,2)(0,0,0)[0]                   : AIC=82.448, Time=0.16 sec
 ARIMA(0,0,2)(0,0,0)[0]                   : AIC=91.897, Time=0.06 sec
 ARIMA(2,0,0)(0,0,0)[0]                   : AIC=89.618, Time=0.04 sec
 ARIMA(2,0,2)(0,0,0)[0]                   : AIC=83.478, Time=0.26 sec
 ARIMA(1,0,1)(0,0,0)[0] intercept   : AIC=79.510, Time=0.29 sec
 ARIMA(0,0,1)(0,0,0)[0] intercept   : AIC=79.788, Time=0.06 sec
 ARIMA(1,0,0)(0,0,0)[0] intercept   : AIC=79.780, Time=0.04 sec
 ARIMA(2,0,1)(0,0,0)[0] intercept   : AIC=80.529, Time=0.33 sec
 ARIMA(1,0,2)(0,0,0)[0] intercept   : AIC=80.481, Time=0.23 sec
 ARIMA(0,0,0)(0,0,0)[0] intercept   : AIC=77.829, Time=0.05 sec

Best model:  ARIMA(0,0,0)(0,0,0)[0] intercept
Total fit time: 2.031 seconds
Warning: Invalid prediction range for item B0BNL71DN2. Skipping
forecast.
Performing stepwise search to minimize aic
 ARIMA(1,0,1)(0,0,0)[0]                   : AIC=298.045, Time=0.10 sec
 ARIMA(0,0,0)(0,0,0)[0]                   : AIC=326.189, Time=0.05 sec
 ARIMA(1,0,0)(0,0,0)[0]                   : AIC=317.567, Time=0.03 sec
 ARIMA(0,0,1)(0,0,0)[0]                   : AIC=321.158, Time=0.03 sec
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```
 ARIMA(2,0,1)(0,0,0)[0]              : AIC=299.267, Time=0.12 sec
 ARIMA(1,0,2)(0,0,0)[0]              : AIC=299.357, Time=0.12 sec
 ARIMA(0,0,2)(0,0,0)[0]              : AIC=312.764, Time=0.05 sec
 ARIMA(2,0,0)(0,0,0)[0]              : AIC=306.714, Time=0.04 sec
 ARIMA(2,0,2)(0,0,0)[0]              : AIC=300.798, Time=0.24 sec
 ARIMA(1,0,1)(0,0,0)[0] intercept    : AIC=294.529, Time=0.19 sec
 ARIMA(0,0,1)(0,0,0)[0] intercept    : AIC=299.784, Time=0.07 sec
 ARIMA(1,0,0)(0,0,0)[0] intercept    : AIC=299.245, Time=0.05 sec
 ARIMA(2,0,1)(0,0,0)[0] intercept    : AIC=295.075, Time=0.20 sec
 ARIMA(1,0,2)(0,0,0)[0] intercept    : AIC=295.128, Time=0.38 sec
 ARIMA(0,0,0)(0,0,0)[0] intercept    : AIC=299.349, Time=0.06 sec
 ARIMA(0,0,2)(0,0,0)[0] intercept    : AIC=296.712, Time=0.08 sec
 ARIMA(2,0,0)(0,0,0)[0] intercept    : AIC=295.534, Time=0.09 sec
 ARIMA(2,0,2)(0,0,0)[0] intercept    : AIC=297.134, Time=0.42 sec

Best model:  ARIMA(1,0,1)(0,0,0)[0] intercept
Total fit time: 2.320 seconds
Performing stepwise search to minimize aic
 ARIMA(1,0,1)(0,0,0)[0]              : AIC=121.236, Time=0.08 sec
 ARIMA(0,0,0)(0,0,0)[0]              : AIC=123.575, Time=0.03 sec
 ARIMA(1,0,0)(0,0,0)[0]              : AIC=119.507, Time=0.03 sec

/usr/local/lib/python3.10/dist-packages/statsmodels/tsa/base/
tsa_model.py:836: ValueWarning: No supported index is available.
Prediction results will be given with an integer index beginning at
`start`.
  return get_prediction_index(
/usr/local/lib/python3.10/dist-packages/statsmodels/tsa/base/tsa_model
.py:836: FutureWarning: No supported index is available. In the next
version, calling this method in a model without a supported index will
result in an exception.
  return get_prediction_index(

 ARIMA(0,0,1)(0,0,0)[0]              : AIC=120.044, Time=0.06 sec
 ARIMA(2,0,0)(0,0,0)[0]              : AIC=121.358, Time=0.04 sec
 ARIMA(2,0,1)(0,0,0)[0]              : AIC=inf, Time=0.24 sec
 ARIMA(1,0,0)(0,0,0)[0] intercept    : AIC=112.179, Time=0.04 sec
 ARIMA(0,0,0)(0,0,0)[0] intercept    : AIC=111.826, Time=0.04 sec
 ARIMA(0,0,1)(0,0,0)[0] intercept    : AIC=111.994, Time=0.04 sec
 ARIMA(1,0,1)(0,0,0)[0] intercept    : AIC=113.222, Time=0.12 sec

Best model:  ARIMA(0,0,0)(0,0,0)[0] intercept
Total fit time: 0.741 seconds
Warning: Invalid prediction range for item B0BNLBQN9N. Skipping
forecast.
Performing stepwise search to minimize aic
 ARIMA(1,0,1)(0,0,0)[0]              : AIC=-35.638, Time=0.02 sec
 ARIMA(0,0,0)(0,0,0)[0]              : AIC=-39.638, Time=0.03 sec
 ARIMA(1,0,0)(0,0,0)[0]              : AIC=-37.638, Time=0.02 sec
 ARIMA(0,0,1)(0,0,0)[0]              : AIC=-37.638, Time=0.02 sec
```

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 ARIMA(0,0,0)(0,0,0)[0] intercept   : AIC=-38.649, Time=0.04 sec

Best model:  ARIMA(0,0,0)(0,0,0)[0]
Total fit time: 0.139 seconds
Warning: Invalid prediction range for item B0BNKZBVQ1. Skipping
forecast.
Performing stepwise search to minimize aic
 ARIMA(1,0,1)(0,0,0)[0]                 : AIC=-51.205, Time=0.03 sec
 ARIMA(0,0,0)(0,0,0)[0]                 : AIC=-55.205, Time=0.03 sec
 ARIMA(1,0,0)(0,0,0)[0]                 : AIC=-53.205, Time=0.05 sec
 ARIMA(0,0,1)(0,0,0)[0]                 : AIC=-53.205, Time=0.04 sec
 ARIMA(0,0,0)(0,0,0)[0] intercept   : AIC=-55.233, Time=0.04 sec
 ARIMA(1,0,0)(0,0,0)[0] intercept   : AIC=-53.261, Time=0.08 sec
 ARIMA(0,0,1)(0,0,0)[0] intercept   : AIC=-53.263, Time=0.06 sec
 ARIMA(1,0,1)(0,0,0)[0] intercept   : AIC=-52.329, Time=0.24 sec

Best model:  ARIMA(0,0,0)(0,0,0)[0] intercept
Total fit time: 0.585 seconds
Warning: Invalid prediction range for item B0BNKZCJR6. Skipping
forecast.
Performing stepwise search to minimize aic
 ARIMA(1,1,1)(0,0,0)[0] intercept   : AIC=591.282, Time=0.11 sec
 ARIMA(0,1,0)(0,0,0)[0] intercept   : AIC=648.109, Time=0.02 sec
 ARIMA(1,1,0)(0,0,0)[0] intercept   : AIC=625.825, Time=0.05 sec
 ARIMA(0,1,1)(0,0,0)[0] intercept   : AIC=590.478, Time=0.06 sec
 ARIMA(0,1,0)(0,0,0)[0]                 : AIC=646.109, Time=0.02 sec
 ARIMA(0,1,2)(0,0,0)[0] intercept   : AIC=590.771, Time=0.10 sec
 ARIMA(1,1,2)(0,0,0)[0] intercept   : AIC=592.491, Time=0.21 sec
 ARIMA(0,1,1)(0,0,0)[0]                 : AIC=588.478, Time=0.03 sec
 ARIMA(1,1,1)(0,0,0)[0]                 : AIC=589.282, Time=0.06 sec
 ARIMA(0,1,2)(0,0,0)[0]                 : AIC=588.772, Time=0.05 sec
 ARIMA(1,1,0)(0,0,0)[0]                 : AIC=623.825, Time=0.03 sec
 ARIMA(1,1,2)(0,0,0)[0]                 : AIC=590.491, Time=0.09 sec

Best model:  ARIMA(0,1,1)(0,0,0)[0]
Total fit time: 0.858 seconds
Warning: Invalid prediction range for item B0BVVCP59B. Skipping
forecast.
Performing stepwise search to minimize aic
 ARIMA(1,0,1)(0,0,0)[0]                 : AIC=267.695, Time=0.16 sec
 ARIMA(0,0,0)(0,0,0)[0]                 : AIC=281.735, Time=0.04 sec
 ARIMA(1,0,0)(0,0,0)[0]                 : AIC=270.232, Time=0.03 sec
 ARIMA(0,0,1)(0,0,0)[0]                 : AIC=271.900, Time=0.03 sec
 ARIMA(2,0,1)(0,0,0)[0]                 : AIC=264.544, Time=0.23 sec
 ARIMA(2,0,0)(0,0,0)[0]                 : AIC=272.018, Time=0.04 sec
 ARIMA(3,0,1)(0,0,0)[0]                 : AIC=275.645, Time=0.16 sec
 ARIMA(2,0,2)(0,0,0)[0]                 : AIC=266.391, Time=0.46 sec
 ARIMA(1,0,2)(0,0,0)[0]                 : AIC=264.437, Time=0.28 sec
 ARIMA(0,0,2)(0,0,0)[0]                 : AIC=271.909, Time=0.04 sec
 ARIMA(1,0,3)(0,0,0)[0]                 : AIC=266.337, Time=0.26 sec
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 ARIMA(0,0,3)(0,0,0)[0]                    : AIC=273.755, Time=0.06 sec
 ARIMA(2,0,3)(0,0,0)[0]                    : AIC=267.614, Time=0.43 sec
 ARIMA(1,0,2)(0,0,0)[0] intercept   : AIC=262.962, Time=0.10 sec
 ARIMA(0,0,2)(0,0,0)[0] intercept   : AIC=260.835, Time=0.08 sec
 ARIMA(0,0,1)(0,0,0)[0] intercept   : AIC=258.963, Time=0.09 sec
 ARIMA(0,0,0)(0,0,0)[0] intercept   : AIC=263.010, Time=0.07 sec
 ARIMA(1,0,1)(0,0,0)[0] intercept   : AIC=260.900, Time=0.10 sec
 ARIMA(1,0,0)(0,0,0)[0] intercept   : AIC=259.040, Time=0.06 sec

Best model:  ARIMA(0,0,1)(0,0,0)[0] intercept
Total fit time: 2.735 seconds
Performing stepwise search to minimize aic
 ARIMA(1,0,1)(0,0,0)[0]                    : AIC=1503.153, Time=0.12 sec

/usr/local/lib/python3.10/dist-packages/statsmodels/tsa/base/
tsa_model.py:836: ValueWarning: No supported index is available.
Prediction results will be given with an integer index beginning at
`start`.
  return get_prediction_index(
/usr/local/lib/python3.10/dist-packages/statsmodels/tsa/base/tsa_model
.py:836: FutureWarning: No supported index is available. In the next
version, calling this method in a model without a supported index will
result in an exception.
  return get_prediction_index(

 ARIMA(0,0,0)(0,0,0)[0]                    : AIC=1660.169, Time=0.05 sec
 ARIMA(1,0,0)(0,0,0)[0]                    : AIC=1507.812, Time=0.05 sec
 ARIMA(0,0,1)(0,0,0)[0]                    : AIC=1562.095, Time=0.14 sec
 ARIMA(2,0,1)(0,0,0)[0]                    : AIC=1500.871, Time=1.52 sec
 ARIMA(2,0,0)(0,0,0)[0]                    : AIC=1505.677, Time=0.11 sec
 ARIMA(3,0,1)(0,0,0)[0]                    : AIC=1502.866, Time=0.54 sec
 ARIMA(2,0,2)(0,0,0)[0]                    : AIC=1502.863, Time=0.43 sec
 ARIMA(1,0,2)(0,0,0)[0]                    : AIC=1501.363, Time=1.23 sec
 ARIMA(3,0,0)(0,0,0)[0]                    : AIC=1503.782, Time=0.08 sec
 ARIMA(3,0,2)(0,0,0)[0]                    : AIC=1501.752, Time=0.45 sec
 ARIMA(2,0,1)(0,0,0)[0] intercept   : AIC=1500.139, Time=0.25 sec
 ARIMA(1,0,1)(0,0,0)[0] intercept   : AIC=1500.577, Time=0.10 sec
 ARIMA(2,0,0)(0,0,0)[0] intercept   : AIC=1502.010, Time=0.09 sec
 ARIMA(3,0,1)(0,0,0)[0] intercept   : AIC=1501.710, Time=0.32 sec
 ARIMA(2,0,2)(0,0,0)[0] intercept   : AIC=1501.890, Time=0.31 sec
 ARIMA(1,0,0)(0,0,0)[0] intercept   : AIC=1502.725, Time=0.06 sec
 ARIMA(1,0,2)(0,0,0)[0] intercept   : AIC=1499.942, Time=0.18 sec
 ARIMA(0,0,2)(0,0,0)[0] intercept   : AIC=1520.490, Time=0.14 sec
 ARIMA(1,0,3)(0,0,0)[0] intercept   : AIC=1501.816, Time=0.24 sec
 ARIMA(0,0,1)(0,0,0)[0] intercept   : AIC=1543.910, Time=0.07 sec
 ARIMA(0,0,3)(0,0,0)[0] intercept   : AIC=1517.695, Time=0.21 sec
 ARIMA(2,0,3)(0,0,0)[0] intercept   : AIC=1503.652, Time=0.30 sec

Best model:  ARIMA(1,0,2)(0,0,0)[0] intercept
Total fit time: 7.051 seconds
```

```
Performing stepwise search to minimize aic
 ARIMA(1,0,1)(0,0,0)[0]                  : AIC=1501.144, Time=0.05 sec
 ARIMA(0,0,0)(0,0,0)[0]                  : AIC=1708.201, Time=0.02 sec
 ARIMA(1,0,0)(0,0,0)[0]                  : AIC=1502.771, Time=0.03 sec
 ARIMA(0,0,1)(0,0,0)[0]                  : AIC=1562.327, Time=0.04 sec

/usr/local/lib/python3.10/dist-packages/statsmodels/tsa/base/
tsa_model.py:836: ValueWarning: No supported index is available.
Prediction results will be given with an integer index beginning at
`start`.
  return get_prediction_index(
/usr/local/lib/python3.10/dist-packages/statsmodels/tsa/base/tsa_model
.py:836: FutureWarning: No supported index is available. In the next
version, calling this method in a model without a supported index will
result in an exception.
  return get_prediction_index(

 ARIMA(2,0,1)(0,0,0)[0]                  : AIC=1504.734, Time=0.22 sec
 ARIMA(1,0,2)(0,0,0)[0]                  : AIC=1486.272, Time=0.10 sec
 ARIMA(0,0,2)(0,0,0)[0]                  : AIC=1539.752, Time=0.07 sec
 ARIMA(2,0,2)(0,0,0)[0]                  : AIC=1488.243, Time=0.16 sec
 ARIMA(1,0,3)(0,0,0)[0]                  : AIC=1488.251, Time=0.12 sec
 ARIMA(0,0,3)(0,0,0)[0]                  : AIC=1525.871, Time=0.08 sec
 ARIMA(2,0,3)(0,0,0)[0]                  : AIC=1489.891, Time=0.51 sec
 ARIMA(1,0,2)(0,0,0)[0] intercept    : AIC=1485.976, Time=0.24 sec
 ARIMA(0,0,2)(0,0,0)[0] intercept    : AIC=1524.417, Time=0.13 sec
 ARIMA(1,0,1)(0,0,0)[0] intercept    : AIC=1497.940, Time=0.13 sec
 ARIMA(2,0,2)(0,0,0)[0] intercept    : AIC=1487.848, Time=0.29 sec
 ARIMA(1,0,3)(0,0,0)[0] intercept    : AIC=1487.881, Time=0.25 sec
 ARIMA(0,0,1)(0,0,0)[0] intercept    : AIC=1541.005, Time=0.09 sec
 ARIMA(0,0,3)(0,0,0)[0] intercept    : AIC=1513.424, Time=0.21 sec
 ARIMA(2,0,1)(0,0,0)[0] intercept    : AIC=1499.223, Time=0.31 sec
 ARIMA(2,0,3)(0,0,0)[0] intercept    : AIC=1489.816, Time=0.25 sec

Best model:  ARIMA(1,0,2)(0,0,0)[0] intercept
Total fit time: 3.324 seconds
Performing stepwise search to minimize aic
 ARIMA(1,0,1)(0,0,0)[0]                  : AIC=205.445, Time=0.10 sec
 ARIMA(0,0,0)(0,0,0)[0]                  : AIC=226.702, Time=0.03 sec

/usr/local/lib/python3.10/dist-packages/statsmodels/tsa/base/
tsa_model.py:836: ValueWarning: No supported index is available.
Prediction results will be given with an integer index beginning at
`start`.
  return get_prediction_index(
/usr/local/lib/python3.10/dist-packages/statsmodels/tsa/base/tsa_model
.py:836: FutureWarning: No supported index is available. In the next
version, calling this method in a model without a supported index will
result in an exception.
  return get_prediction_index(
```

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 ARIMA(1,0,0)(0,0,0)[0]                   : AIC=215.503, Time=0.06 sec
 ARIMA(0,0,1)(0,0,0)[0]                   : AIC=217.277, Time=0.04 sec
 ARIMA(2,0,1)(0,0,0)[0]                   : AIC=207.243, Time=0.12 sec
 ARIMA(1,0,2)(0,0,0)[0]                   : AIC=inf, Time=0.25 sec
 ARIMA(0,0,2)(0,0,0)[0]                   : AIC=218.708, Time=0.06 sec
 ARIMA(2,0,0)(0,0,0)[0]                   : AIC=215.896, Time=0.04 sec
 ARIMA(2,0,2)(0,0,0)[0]                   : AIC=inf, Time=0.44 sec
 ARIMA(1,0,1)(0,0,0)[0] intercept    : AIC=201.541, Time=0.28 sec
 ARIMA(0,0,1)(0,0,0)[0] intercept    : AIC=201.797, Time=0.06 sec
 ARIMA(1,0,0)(0,0,0)[0] intercept    : AIC=201.806, Time=0.06 sec
 ARIMA(2,0,1)(0,0,0)[0] intercept    : AIC=inf, Time=0.43 sec
 ARIMA(1,0,2)(0,0,0)[0] intercept    : AIC=203.365, Time=0.26 sec
 ARIMA(0,0,0)(0,0,0)[0] intercept    : AIC=204.354, Time=0.06 sec
 ARIMA(0,0,2)(0,0,0)[0] intercept    : AIC=203.777, Time=0.11 sec
 ARIMA(2,0,0)(0,0,0)[0] intercept    : AIC=203.788, Time=0.07 sec
 ARIMA(2,0,2)(0,0,0)[0] intercept    : AIC=inf, Time=0.50 sec

Best model:  ARIMA(1,0,1)(0,0,0)[0] intercept
Total fit time: 2.994 seconds
Warning: Invalid prediction range for item B0BT4Y4SMT. Skipping
forecast.
Performing stepwise search to minimize aic
 ARIMA(1,1,1)(0,0,0)[0] intercept    : AIC=607.241, Time=0.17 sec
 ARIMA(0,1,0)(0,0,0)[0] intercept    : AIC=679.251, Time=0.03 sec
 ARIMA(1,1,0)(0,0,0)[0] intercept    : AIC=652.485, Time=0.04 sec
 ARIMA(0,1,1)(0,0,0)[0] intercept    : AIC=607.057, Time=0.16 sec
 ARIMA(0,1,0)(0,0,0)[0]                   : AIC=677.251, Time=0.02 sec
 ARIMA(0,1,2)(0,0,0)[0] intercept    : AIC=606.794, Time=0.10 sec
 ARIMA(1,1,2)(0,0,0)[0] intercept    : AIC=604.856, Time=0.17 sec
 ARIMA(2,1,2)(0,0,0)[0] intercept    : AIC=606.854, Time=0.68 sec
 ARIMA(1,1,3)(0,0,0)[0] intercept    : AIC=606.854, Time=1.36 sec
 ARIMA(0,1,3)(0,0,0)[0] intercept    : AIC=607.775, Time=0.49 sec
 ARIMA(2,1,1)(0,0,0)[0] intercept    : AIC=607.890, Time=0.45 sec
 ARIMA(2,1,3)(0,0,0)[0] intercept    : AIC=608.854, Time=1.11 sec
 ARIMA(1,1,2)(0,0,0)[0]                   : AIC=602.888, Time=0.10 sec
 ARIMA(0,1,2)(0,0,0)[0]                   : AIC=604.830, Time=0.06 sec
 ARIMA(1,1,1)(0,0,0)[0]                   : AIC=605.277, Time=0.09 sec
 ARIMA(2,1,2)(0,0,0)[0]                   : AIC=604.886, Time=0.13 sec
 ARIMA(1,1,3)(0,0,0)[0]                   : AIC=604.886, Time=0.14 sec
 ARIMA(0,1,1)(0,0,0)[0]                   : AIC=605.082, Time=0.04 sec
 ARIMA(0,1,3)(0,0,0)[0]                   : AIC=605.802, Time=0.11 sec
 ARIMA(2,1,1)(0,0,0)[0]                   : AIC=605.915, Time=0.08 sec
 ARIMA(2,1,3)(0,0,0)[0]                   : AIC=606.886, Time=0.10 sec

Best model:  ARIMA(1,1,2)(0,0,0)[0]
Total fit time: 5.655 seconds
Warning: Invalid prediction range for item B0BT51RJS3. Skipping
forecast.
Performing stepwise search to minimize aic
 ARIMA(1,1,1)(0,0,0)[0] intercept    : AIC=inf, Time=0.60 sec
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 ARIMA(0,1,0)(0,0,0)[0] intercept   : AIC=1283.953, Time=0.02 sec
 ARIMA(1,1,0)(0,0,0)[0] intercept   : AIC=1280.477, Time=0.08 sec
 ARIMA(0,1,1)(0,0,0)[0] intercept   : AIC=1274.578, Time=0.09 sec
 ARIMA(0,1,0)(0,0,0)[0]             : AIC=1281.954, Time=0.03 sec
 ARIMA(0,1,2)(0,0,0)[0] intercept   : AIC=1241.344, Time=0.15 sec
 ARIMA(1,1,2)(0,0,0)[0] intercept   : AIC=inf, Time=0.72 sec
 ARIMA(0,1,3)(0,0,0)[0] intercept   : AIC=1228.871, Time=0.29 sec
 ARIMA(1,1,3)(0,0,0)[0] intercept   : AIC=inf, Time=0.92 sec
 ARIMA(0,1,3)(0,0,0)[0]             : AIC=1226.902, Time=0.11 sec
 ARIMA(0,1,2)(0,0,0)[0]             : AIC=1239.344, Time=0.07 sec
 ARIMA(1,1,3)(0,0,0)[0]             : AIC=1228.489, Time=0.24 sec
 ARIMA(1,1,2)(0,0,0)[0]             : AIC=1226.784, Time=0.15 sec
 ARIMA(1,1,1)(0,0,0)[0]             : AIC=1227.205, Time=0.19 sec
 ARIMA(2,1,2)(0,0,0)[0]             : AIC=1228.725, Time=0.30 sec
 ARIMA(0,1,1)(0,0,0)[0]             : AIC=1272.578, Time=0.03 sec
 ARIMA(2,1,1)(0,0,0)[0]             : AIC=1226.755, Time=0.19 sec
 ARIMA(2,1,0)(0,0,0)[0]             : AIC=1266.742, Time=0.04 sec
 ARIMA(3,1,1)(0,0,0)[0]             : AIC=1228.684, Time=0.22 sec
 ARIMA(1,1,0)(0,0,0)[0]             : AIC=1278.477, Time=0.03 sec
 ARIMA(3,1,0)(0,0,0)[0]             : AIC=1255.904, Time=0.06 sec
 ARIMA(3,1,2)(0,0,0)[0]             : AIC=1229.138, Time=0.52 sec
 ARIMA(2,1,1)(0,0,0)[0] intercept   : AIC=inf, Time=0.65 sec

Best model:  ARIMA(2,1,1)(0,0,0)[0]
Total fit time: 5.763 seconds
Warning: Invalid prediction range for item B0BT51ZHFD. Skipping
forecast.
Performing stepwise search to minimize aic
 ARIMA(1,0,1)(0,0,0)[0]             : AIC=616.901, Time=0.06 sec
 ARIMA(0,0,0)(0,0,0)[0]             : AIC=780.779, Time=0.01 sec
 ARIMA(1,0,0)(0,0,0)[0]             : AIC=642.870, Time=0.03 sec
 ARIMA(0,0,1)(0,0,0)[0]             : AIC=716.207, Time=0.04 sec
 ARIMA(2,0,1)(0,0,0)[0]             : AIC=618.898, Time=0.13 sec
 ARIMA(1,0,2)(0,0,0)[0]             : AIC=618.900, Time=0.07 sec
 ARIMA(0,0,2)(0,0,0)[0]             : AIC=669.088, Time=0.05 sec
 ARIMA(2,0,0)(0,0,0)[0]             : AIC=620.206, Time=0.04 sec
 ARIMA(2,0,2)(0,0,0)[0]             : AIC=616.386, Time=0.14 sec
 ARIMA(3,0,2)(0,0,0)[0]             : AIC=615.484, Time=0.22 sec
 ARIMA(3,0,1)(0,0,0)[0]             : AIC=618.829, Time=0.15 sec
 ARIMA(3,0,3)(0,0,0)[0]             : AIC=613.114, Time=0.47 sec
 ARIMA(2,0,3)(0,0,0)[0]             : AIC=614.628, Time=0.14 sec
 ARIMA(3,0,3)(0,0,0)[0] intercept   : AIC=613.791, Time=0.69 sec

Best model:  ARIMA(3,0,3)(0,0,0)[0]
Total fit time: 2.278 seconds
Warning: Invalid prediction range for item B0BVSMLG96. Skipping
forecast.
Performing stepwise search to minimize aic
 ARIMA(1,0,1)(0,0,0)[0]             : AIC=457.406, Time=0.06 sec
 ARIMA(0,0,0)(0,0,0)[0]             : AIC=684.171, Time=0.01 sec
```

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 ARIMA(1,0,0)(0,0,0)[0]                  : AIC=455.540, Time=0.04 sec
 ARIMA(0,0,1)(0,0,0)[0]                  : AIC=570.149, Time=0.04 sec
 ARIMA(2,0,0)(0,0,0)[0]                  : AIC=457.367, Time=0.06 sec
 ARIMA(2,0,1)(0,0,0)[0]                  : AIC=459.076, Time=0.11 sec
 ARIMA(1,0,0)(0,0,0)[0] intercept        : AIC=456.603, Time=0.06 sec

Best model:  ARIMA(1,0,0)(0,0,0)[0]
Total fit time: 0.393 seconds
Warning: Invalid prediction range for item B0BVV92DBG. Skipping
forecast.
Performing stepwise search to minimize aic
 ARIMA(1,0,1)(0,0,0)[0]                  : AIC=675.408, Time=0.06 sec
 ARIMA(0,0,0)(0,0,0)[0]                  : AIC=705.690, Time=0.02 sec
 ARIMA(1,0,0)(0,0,0)[0]                  : AIC=682.729, Time=0.03 sec
 ARIMA(0,0,1)(0,0,0)[0]                  : AIC=691.455, Time=0.03 sec
 ARIMA(2,0,1)(0,0,0)[0]                  : AIC=676.364, Time=0.08 sec
 ARIMA(1,0,2)(0,0,0)[0]                  : AIC=675.635, Time=0.05 sec
 ARIMA(0,0,2)(0,0,0)[0]                  : AIC=686.203, Time=0.04 sec
 ARIMA(2,0,0)(0,0,0)[0]                  : AIC=676.136, Time=0.03 sec
 ARIMA(2,0,2)(0,0,0)[0]                  : AIC=676.474, Time=0.09 sec
 ARIMA(1,0,1)(0,0,0)[0] intercept        : AIC=674.383, Time=0.15 sec
 ARIMA(0,0,1)(0,0,0)[0] intercept        : AIC=683.732, Time=0.13 sec
 ARIMA(1,0,0)(0,0,0)[0] intercept        : AIC=678.470, Time=0.09 sec
 ARIMA(2,0,1)(0,0,0)[0] intercept        : AIC=675.290, Time=0.24 sec
 ARIMA(1,0,2)(0,0,0)[0] intercept        : AIC=674.405, Time=0.34 sec
 ARIMA(0,0,0)(0,0,0)[0] intercept        : AIC=693.387, Time=0.03 sec
 ARIMA(0,0,2)(0,0,0)[0] intercept        : AIC=680.355, Time=0.27 sec
 ARIMA(2,0,0)(0,0,0)[0] intercept        : AIC=674.301, Time=0.31 sec
 ARIMA(3,0,0)(0,0,0)[0] intercept        : AIC=674.273, Time=0.63 sec
 ARIMA(3,0,1)(0,0,0)[0] intercept        : AIC=676.044, Time=0.38 sec
 ARIMA(3,0,0)(0,0,0)[0]                  : AIC=675.155, Time=0.12 sec

Best model:  ARIMA(3,0,0)(0,0,0)[0] intercept
Total fit time: 3.183 seconds
Warning: Invalid prediction range for item B0BVV9XSSF. Skipping
forecast.
Performing stepwise search to minimize aic
 ARIMA(1,0,1)(0,0,0)[0]                  : AIC=833.051, Time=0.11 sec
 ARIMA(0,0,0)(0,0,0)[0]                  : AIC=965.895, Time=0.02 sec
 ARIMA(1,0,0)(0,0,0)[0]                  : AIC=853.475, Time=0.04 sec
 ARIMA(0,0,1)(0,0,0)[0]                  : AIC=911.978, Time=0.10 sec
 ARIMA(2,0,1)(0,0,0)[0]                  : AIC=828.290, Time=0.17 sec
 ARIMA(2,0,0)(0,0,0)[0]                  : AIC=826.457, Time=0.10 sec
 ARIMA(3,0,0)(0,0,0)[0]                  : AIC=828.179, Time=0.14 sec
 ARIMA(3,0,1)(0,0,0)[0]                  : AIC=829.522, Time=0.45 sec
 ARIMA(2,0,0)(0,0,0)[0] intercept        : AIC=826.461, Time=0.31 sec

Best model:  ARIMA(2,0,0)(0,0,0)[0]
Total fit time: 1.476 seconds
Warning: Invalid prediction range for item B0BVVDLPX8. Skipping
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forecast.
Performing stepwise search to minimize aic
 ARIMA(1,0,1)(0,0,0)[0]                    : AIC=2154.657, Time=0.09 sec
 ARIMA(0,0,0)(0,0,0)[0]                    : AIC=2295.543, Time=0.02 sec
 ARIMA(1,0,0)(0,0,0)[0]                    : AIC=2180.861, Time=0.04 sec
 ARIMA(0,0,1)(0,0,0)[0]                    : AIC=2217.565, Time=0.05 sec
 ARIMA(2,0,1)(0,0,0)[0]                    : AIC=2154.435, Time=0.15 sec
 ARIMA(2,0,0)(0,0,0)[0]                    : AIC=2170.596, Time=0.07 sec
 ARIMA(3,0,1)(0,0,0)[0]                    : AIC=2154.815, Time=0.15 sec
 ARIMA(2,0,2)(0,0,0)[0]                    : AIC=2155.029, Time=0.21 sec
 ARIMA(1,0,2)(0,0,0)[0]                    : AIC=2153.905, Time=0.10 sec
 ARIMA(0,0,2)(0,0,0)[0]                    : AIC=2201.531, Time=0.07 sec
 ARIMA(1,0,3)(0,0,0)[0]                    : AIC=2154.845, Time=0.17 sec
 ARIMA(0,0,3)(0,0,0)[0]                    : AIC=2189.039, Time=0.09 sec
 ARIMA(2,0,3)(0,0,0)[0]                    : AIC=2156.767, Time=0.25 sec
 ARIMA(1,0,2)(0,0,0)[0] intercept   : AIC=2151.851, Time=0.23 sec
 ARIMA(0,0,2)(0,0,0)[0] intercept   : AIC=2183.123, Time=0.18 sec
 ARIMA(1,0,1)(0,0,0)[0] intercept   : AIC=2151.995, Time=0.16 sec
 ARIMA(2,0,2)(0,0,0)[0] intercept   : AIC=2152.774, Time=0.48 sec
 ARIMA(1,0,3)(0,0,0)[0] intercept   : AIC=2152.334, Time=0.29 sec
 ARIMA(0,0,1)(0,0,0)[0] intercept   : AIC=2193.782, Time=0.12 sec
 ARIMA(0,0,3)(0,0,0)[0] intercept   : AIC=2174.186, Time=0.27 sec
 ARIMA(2,0,1)(0,0,0)[0] intercept   : AIC=2152.344, Time=0.42 sec
 ARIMA(2,0,3)(0,0,0)[0] intercept   : AIC=2153.877, Time=0.71 sec

Best model:  ARIMA(1,0,2)(0,0,0)[0] intercept
Total fit time: 4.363 seconds
Performing stepwise search to minimize aic

/usr/local/lib/python3.10/dist-packages/statsmodels/tsa/base/
tsa_model.py:836: ValueWarning: No supported index is available.
Prediction results will be given with an integer index beginning at
`start`.
  return get_prediction_index(
/usr/local/lib/python3.10/dist-packages/statsmodels/tsa/base/tsa_model
.py:836: FutureWarning: No supported index is available. In the next
version, calling this method in a model without a supported index will
result in an exception.
  return get_prediction_index(

 ARIMA(1,1,1)(0,0,0)[0] intercept   : AIC=inf, Time=0.37 sec
 ARIMA(0,1,0)(0,0,0)[0] intercept   : AIC=988.462, Time=0.02 sec
 ARIMA(1,1,0)(0,0,0)[0] intercept   : AIC=988.146, Time=0.05 sec
 ARIMA(0,1,1)(0,0,0)[0] intercept   : AIC=983.134, Time=0.08 sec
 ARIMA(0,1,0)(0,0,0)[0]                    : AIC=986.462, Time=0.02 sec
 ARIMA(0,1,2)(0,0,0)[0] intercept   : AIC=inf, Time=0.58 sec
 ARIMA(1,1,2)(0,0,0)[0] intercept   : AIC=inf, Time=0.61 sec
 ARIMA(0,1,1)(0,0,0)[0]                    : AIC=981.134, Time=0.04 sec
 ARIMA(1,1,1)(0,0,0)[0]                    : AIC=928.012, Time=0.10 sec
 ARIMA(1,1,0)(0,0,0)[0]                    : AIC=986.146, Time=0.03 sec
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 ARIMA(2,1,1)(0,0,0)[0]               : AIC=920.280, Time=0.16 sec
 ARIMA(2,1,0)(0,0,0)[0]               : AIC=963.553, Time=0.04 sec
 ARIMA(3,1,1)(0,0,0)[0]               : AIC=921.552, Time=0.20 sec
 ARIMA(2,1,2)(0,0,0)[0]               : AIC=921.204, Time=0.27 sec
 ARIMA(1,1,2)(0,0,0)[0]               : AIC=919.264, Time=0.13 sec
 ARIMA(0,1,2)(0,0,0)[0]               : AIC=920.787, Time=0.11 sec
 ARIMA(1,1,3)(0,0,0)[0]               : AIC=921.206, Time=0.29 sec
 ARIMA(0,1,3)(0,0,0)[0]               : AIC=919.229, Time=0.12 sec
 ARIMA(0,1,3)(0,0,0)[0] intercept     : AIC=inf, Time=0.53 sec

Best model:  ARIMA(0,1,3)(0,0,0)[0]
Total fit time: 3.795 seconds
Warning: Invalid prediction range for item B0BT4YQSV2. Skipping
forecast.
Performing stepwise search to minimize aic
 ARIMA(1,0,1)(0,0,0)[0]               : AIC=390.606, Time=0.07 sec
 ARIMA(0,0,0)(0,0,0)[0]               : AIC=399.129, Time=0.02 sec
 ARIMA(1,0,0)(0,0,0)[0]               : AIC=395.912, Time=0.02 sec
 ARIMA(0,0,1)(0,0,0)[0]               : AIC=397.364, Time=0.06 sec
 ARIMA(2,0,1)(0,0,0)[0]               : AIC=inf, Time=0.28 sec
 ARIMA(1,0,2)(0,0,0)[0]               : AIC=inf, Time=0.31 sec
 ARIMA(0,0,2)(0,0,0)[0]               : AIC=394.229, Time=0.04 sec
 ARIMA(2,0,0)(0,0,0)[0]               : AIC=392.477, Time=0.03 sec
 ARIMA(2,0,2)(0,0,0)[0]               : AIC=394.605, Time=0.14 sec
 ARIMA(1,0,1)(0,0,0)[0] intercept     : AIC=386.327, Time=0.11 sec
 ARIMA(0,0,1)(0,0,0)[0] intercept     : AIC=385.663, Time=0.04 sec
 ARIMA(0,0,0)(0,0,0)[0] intercept     : AIC=384.642, Time=0.06 sec
 ARIMA(1,0,0)(0,0,0)[0] intercept     : AIC=385.426, Time=0.06 sec

Best model:  ARIMA(0,0,0)(0,0,0)[0] intercept
Total fit time: 1.267 seconds
Warning: Invalid prediction range for item B0BT52345P. Skipping
forecast.
Performing stepwise search to minimize aic
 ARIMA(1,0,1)(0,0,0)[0]               : AIC=1311.624, Time=0.05 sec
 ARIMA(0,0,0)(0,0,0)[0]               : AIC=1392.406, Time=0.02 sec
 ARIMA(1,0,0)(0,0,0)[0]               : AIC=1316.301, Time=0.03 sec
 ARIMA(0,0,1)(0,0,0)[0]               : AIC=1313.369, Time=0.05 sec
 ARIMA(2,0,1)(0,0,0)[0]               : AIC=1313.003, Time=0.11 sec
 ARIMA(1,0,2)(0,0,0)[0]               : AIC=1302.648, Time=0.29 sec
 ARIMA(0,0,2)(0,0,0)[0]               : AIC=1312.283, Time=0.13 sec
 ARIMA(2,0,2)(0,0,0)[0]               : AIC=1304.048, Time=1.69 sec
 ARIMA(1,0,3)(0,0,0)[0]               : AIC=1304.039, Time=0.77 sec
 ARIMA(0,0,3)(0,0,0)[0]               : AIC=1313.706, Time=0.16 sec
 ARIMA(2,0,3)(0,0,0)[0]               : AIC=1304.848, Time=2.04 sec
 ARIMA(1,0,2)(0,0,0)[0] intercept     : AIC=1300.454, Time=0.12 sec
 ARIMA(0,0,2)(0,0,0)[0] intercept     : AIC=1298.470, Time=0.12 sec
 ARIMA(0,0,1)(0,0,0)[0] intercept     : AIC=1297.247, Time=0.07 sec
 ARIMA(0,0,0)(0,0,0)[0] intercept     : AIC=1362.930, Time=0.03 sec
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 ARIMA(1,0,1)(0,0,0)[0] intercept    : AIC=1298.467, Time=0.11 sec
 ARIMA(1,0,0)(0,0,0)[0] intercept    : AIC=1306.532, Time=0.06 sec

Best model:  ARIMA(0,0,1)(0,0,0)[0] intercept
Total fit time: 5.882 seconds
Performing stepwise search to minimize aic

/usr/local/lib/python3.10/dist-packages/statsmodels/tsa/base/
tsa_model.py:836: ValueWarning: No supported index is available.
Prediction results will be given with an integer index beginning at
`start`.
  return get_prediction_index(
/usr/local/lib/python3.10/dist-packages/statsmodels/tsa/base/tsa_model
.py:836: FutureWarning: No supported index is available. In the next
version, calling this method in a model without a supported index will
result in an exception.
  return get_prediction_index(

 ARIMA(1,1,1)(0,0,0)[0] intercept    : AIC=241.728, Time=0.15 sec
 ARIMA(0,1,0)(0,0,0)[0] intercept    : AIC=315.621, Time=0.05 sec
 ARIMA(1,1,0)(0,0,0)[0] intercept    : AIC=285.040, Time=0.04 sec
 ARIMA(0,1,1)(0,0,0)[0] intercept    : AIC=239.764, Time=0.28 sec
 ARIMA(0,1,0)(0,0,0)[0]              : AIC=313.621, Time=0.02 sec
 ARIMA(0,1,2)(0,0,0)[0] intercept    : AIC=241.716, Time=0.16 sec
 ARIMA(1,1,2)(0,0,0)[0] intercept    : AIC=241.048, Time=0.26 sec
 ARIMA(0,1,1)(0,0,0)[0]              : AIC=237.849, Time=0.05 sec
 ARIMA(1,1,1)(0,0,0)[0]              : AIC=239.811, Time=0.09 sec
 ARIMA(0,1,2)(0,0,0)[0]              : AIC=239.799, Time=0.08 sec
 ARIMA(1,1,0)(0,0,0)[0]              : AIC=283.040, Time=0.03 sec
 ARIMA(1,1,2)(0,0,0)[0]              : AIC=239.125, Time=0.21 sec

Best model:  ARIMA(0,1,1)(0,0,0)[0]
Total fit time: 1.451 seconds
Performing stepwise search to minimize aic
 ARIMA(1,0,1)(0,0,0)[0]              : AIC=15.496, Time=0.07 sec
 ARIMA(0,0,0)(0,0,0)[0]              : AIC=11.496, Time=0.04 sec
 ARIMA(1,0,0)(0,0,0)[0]              : AIC=13.496, Time=0.03 sec

/usr/local/lib/python3.10/dist-packages/statsmodels/tsa/base/
tsa_model.py:836: ValueWarning: No supported index is available.
Prediction results will be given with an integer index beginning at
`start`.
  return get_prediction_index(
/usr/local/lib/python3.10/dist-packages/statsmodels/tsa/base/tsa_model
.py:836: FutureWarning: No supported index is available. In the next
version, calling this method in a model without a supported index will
result in an exception.
  return get_prediction_index(
```

```
 ARIMA(0,0,1)(0,0,0)[0]                   : AIC=13.496, Time=0.06 sec
 ARIMA(0,0,0)(0,0,0)[0] intercept    : AIC=12.488, Time=0.04 sec

Best model:  ARIMA(0,0,0)(0,0,0)[0]
Total fit time: 0.249 seconds
Warning: Invalid prediction range for item B0BNL2DXZ8. Skipping
forecast.
Performing stepwise search to minimize aic
 ARIMA(1,0,1)(0,0,0)[0]                   : AIC=3002.043, Time=0.09 sec
 ARIMA(0,0,0)(0,0,0)[0]                   : AIC=3193.176, Time=0.02 sec
 ARIMA(1,0,0)(0,0,0)[0]                   : AIC=3010.500, Time=0.05 sec
 ARIMA(0,0,1)(0,0,0)[0]                   : AIC=3021.676, Time=0.06 sec
 ARIMA(2,0,1)(0,0,0)[0]                   : AIC=2990.666, Time=0.13 sec
 ARIMA(2,0,0)(0,0,0)[0]                   : AIC=3010.933, Time=0.08 sec
 ARIMA(3,0,1)(0,0,0)[0]                   : AIC=2980.598, Time=0.14 sec
 ARIMA(3,0,0)(0,0,0)[0]                   : AIC=2979.105, Time=0.15 sec
 ARIMA(3,0,0)(0,0,0)[0] intercept    : AIC=2970.735, Time=0.31 sec
 ARIMA(2,0,0)(0,0,0)[0] intercept    : AIC=2993.596, Time=0.13 sec
 ARIMA(3,0,1)(0,0,0)[0] intercept    : AIC=2969.600, Time=0.50 sec
 ARIMA(2,0,1)(0,0,0)[0] intercept    : AIC=2973.144, Time=0.50 sec
 ARIMA(3,0,2)(0,0,0)[0] intercept    : AIC=2966.178, Time=0.62 sec
 ARIMA(2,0,2)(0,0,0)[0] intercept    : AIC=2964.482, Time=0.46 sec
 ARIMA(1,0,2)(0,0,0)[0] intercept    : AIC=2963.992, Time=0.38 sec
 ARIMA(0,0,2)(0,0,0)[0] intercept    : AIC=2979.627, Time=0.32 sec
 ARIMA(1,0,1)(0,0,0)[0] intercept    : AIC=2977.710, Time=0.26 sec
 ARIMA(1,0,3)(0,0,0)[0] intercept    : AIC=2964.275, Time=0.48 sec
 ARIMA(0,0,1)(0,0,0)[0] intercept    : AIC=2981.391, Time=0.21 sec
 ARIMA(0,0,3)(0,0,0)[0] intercept    : AIC=2976.299, Time=0.37 sec
 ARIMA(2,0,3)(0,0,0)[0] intercept    : AIC=2966.796, Time=0.82 sec
 ARIMA(1,0,2)(0,0,0)[0]                   : AIC=2967.802, Time=0.29 sec

Best model:  ARIMA(1,0,2)(0,0,0)[0] intercept
Total fit time: 6.403 seconds
Performing stepwise search to minimize aic
 ARIMA(1,0,1)(0,0,0)[0]                   : AIC=209.931, Time=0.07 sec
 ARIMA(0,0,0)(0,0,0)[0]                   : AIC=208.762, Time=0.01 sec
 ARIMA(1,0,0)(0,0,0)[0]                   : AIC=210.684, Time=0.02 sec
 ARIMA(0,0,1)(0,0,0)[0]                   : AIC=210.690, Time=0.02 sec
 ARIMA(0,0,0)(0,0,0)[0] intercept    : AIC=205.637, Time=0.01 sec

/usr/local/lib/python3.10/dist-packages/statsmodels/tsa/base/
tsa_model.py:836: ValueWarning: No supported index is available.
Prediction results will be given with an integer index beginning at
`start`.
  return get_prediction_index(
/usr/local/lib/python3.10/dist-packages/statsmodels/tsa/base/tsa_model
.py:836: FutureWarning: No supported index is available. In the next
version, calling this method in a model without a supported index will
result in an exception.
  return get_prediction_index(
```

```
 ARIMA(1,0,0)(0,0,0)[0] intercept   : AIC=207.392, Time=0.06 sec
 ARIMA(0,0,1)(0,0,0)[0] intercept   : AIC=207.356, Time=0.03 sec
 ARIMA(1,0,1)(0,0,0)[0] intercept   : AIC=209.303, Time=0.05 sec

Best model:  ARIMA(0,0,0)(0,0,0)[0] intercept
Total fit time: 0.288 seconds
Warning: Invalid prediction range for item B0CLM65TTQ. Skipping
forecast.
Performing stepwise search to minimize aic
 ARIMA(1,0,1)(0,0,0)[0]             : AIC=69.751, Time=0.03 sec
 ARIMA(0,0,0)(0,0,0)[0]             : AIC=77.752, Time=0.03 sec
 ARIMA(1,0,0)(0,0,0)[0]             : AIC=68.796, Time=0.04 sec
 ARIMA(0,0,1)(0,0,0)[0]             : AIC=69.088, Time=0.03 sec
 ARIMA(2,0,0)(0,0,0)[0]             : AIC=69.958, Time=0.03 sec
 ARIMA(2,0,1)(0,0,0)[0]             : AIC=71.725, Time=0.07 sec
 ARIMA(1,0,0)(0,0,0)[0] intercept   : AIC=68.124, Time=0.03 sec
 ARIMA(0,0,0)(0,0,0)[0] intercept   : AIC=71.731, Time=0.03 sec
 ARIMA(2,0,0)(0,0,0)[0] intercept   : AIC=67.796, Time=0.08 sec
 ARIMA(3,0,0)(0,0,0)[0] intercept   : AIC=69.784, Time=0.13 sec
 ARIMA(2,0,1)(0,0,0)[0] intercept   : AIC=69.788, Time=0.14 sec
 ARIMA(1,0,1)(0,0,0)[0] intercept   : AIC=68.359, Time=0.10 sec
 ARIMA(3,0,1)(0,0,0)[0] intercept   : AIC=71.779, Time=0.86 sec

Best model:  ARIMA(2,0,0)(0,0,0)[0] intercept
Total fit time: 1.607 seconds
Performing stepwise search to minimize aic

/usr/local/lib/python3.10/dist-packages/statsmodels/tsa/base/
tsa_model.py:836: ValueWarning: No supported index is available.
Prediction results will be given with an integer index beginning at
`start`.
  return get_prediction_index(
/usr/local/lib/python3.10/dist-packages/statsmodels/tsa/base/tsa_model
.py:836: FutureWarning: No supported index is available. In the next
version, calling this method in a model without a supported index will
result in an exception.
  return get_prediction_index(

 ARIMA(1,0,1)(0,0,0)[0]             : AIC=177.246, Time=0.62 sec
 ARIMA(0,0,0)(0,0,0)[0]             : AIC=178.606, Time=0.02 sec
 ARIMA(1,0,0)(0,0,0)[0]             : AIC=180.195, Time=0.02 sec
 ARIMA(0,0,1)(0,0,0)[0]             : AIC=180.277, Time=0.06 sec
 ARIMA(2,0,1)(0,0,0)[0]             : AIC=178.662, Time=0.22 sec
 ARIMA(1,0,2)(0,0,0)[0]             : AIC=178.553, Time=0.35 sec
 ARIMA(0,0,2)(0,0,0)[0]             : AIC=181.681, Time=0.07 sec
 ARIMA(2,0,0)(0,0,0)[0]             : AIC=181.391, Time=0.06 sec
 ARIMA(2,0,2)(0,0,0)[0]             : AIC=inf, Time=1.39 sec
 ARIMA(1,0,1)(0,0,0)[0] intercept   : AIC=176.593, Time=0.07 sec
 ARIMA(0,0,1)(0,0,0)[0] intercept   : AIC=174.593, Time=0.03 sec
 ARIMA(0,0,0)(0,0,0)[0] intercept   : AIC=172.825, Time=0.01 sec
```

```
 ARIMA(1,0,0)(0,0,0)[0] intercept   : AIC=174.597, Time=0.03 sec

Best model:  ARIMA(0,0,0)(0,0,0)[0] intercept
Total fit time: 2.988 seconds
Performing stepwise search to minimize aic

/usr/local/lib/python3.10/dist-packages/statsmodels/tsa/base/
tsa_model.py:836: ValueWarning: No supported index is available.
Prediction results will be given with an integer index beginning at
`start`.
  return get_prediction_index(
/usr/local/lib/python3.10/dist-packages/statsmodels/tsa/base/tsa_model
.py:836: FutureWarning: No supported index is available. In the next
version, calling this method in a model without a supported index will
result in an exception.
  return get_prediction_index(

 ARIMA(1,0,1)(0,0,0)[0]                   : AIC=17.096, Time=0.04 sec
 ARIMA(0,0,0)(0,0,0)[0]                   : AIC=13.096, Time=0.02 sec
 ARIMA(1,0,0)(0,0,0)[0]                   : AIC=15.096, Time=0.02 sec
 ARIMA(0,0,1)(0,0,0)[0]                   : AIC=15.096, Time=0.02 sec
 ARIMA(0,0,0)(0,0,0)[0] intercept   : AIC=12.740, Time=0.02 sec
 ARIMA(1,0,0)(0,0,0)[0] intercept   : AIC=13.050, Time=0.02 sec
 ARIMA(0,0,1)(0,0,0)[0] intercept   : AIC=inf, Time=0.08 sec
 ARIMA(1,0,1)(0,0,0)[0] intercept   : AIC=inf, Time=0.15 sec

Best model:  ARIMA(0,0,0)(0,0,0)[0] intercept
Total fit time: 0.390 seconds
Warning: Invalid prediction range for item B0CQVL5T61. Skipping
forecast.
Performing stepwise search to minimize aic
 ARIMA(1,0,1)(0,0,0)[0]                   : AIC=159.478, Time=0.07 sec
 ARIMA(0,0,0)(0,0,0)[0]                   : AIC=183.409, Time=0.02 sec
 ARIMA(1,0,0)(0,0,0)[0]                   : AIC=180.251, Time=0.02 sec
 ARIMA(0,0,1)(0,0,0)[0]                   : AIC=182.943, Time=0.02 sec
 ARIMA(2,0,1)(0,0,0)[0]                   : AIC=155.119, Time=0.10 sec
 ARIMA(2,0,0)(0,0,0)[0]                   : AIC=158.297, Time=0.03 sec
 ARIMA(3,0,1)(0,0,0)[0]                   : AIC=inf, Time=0.24 sec
 ARIMA(2,0,2)(0,0,0)[0]                   : AIC=154.923, Time=0.09 sec
 ARIMA(1,0,2)(0,0,0)[0]                   : AIC=157.169, Time=0.07 sec
 ARIMA(3,0,2)(0,0,0)[0]                   : AIC=156.421, Time=0.18 sec
 ARIMA(2,0,3)(0,0,0)[0]                   : AIC=155.790, Time=0.10 sec
 ARIMA(1,0,3)(0,0,0)[0]                   : AIC=inf, Time=0.27 sec
 ARIMA(3,0,3)(0,0,0)[0]                   : AIC=151.865, Time=0.37 sec
 ARIMA(3,0,3)(0,0,0)[0] intercept   : AIC=148.941, Time=0.28 sec
 ARIMA(2,0,3)(0,0,0)[0] intercept   : AIC=152.795, Time=0.22 sec
 ARIMA(3,0,2)(0,0,0)[0] intercept   : AIC=inf, Time=0.41 sec
 ARIMA(2,0,2)(0,0,0)[0] intercept   : AIC=151.912, Time=0.16 sec
```

```
Best model:  ARIMA(3,0,3)(0,0,0)[0] intercept
Total fit time: 2.707 seconds

/usr/local/lib/python3.10/dist-packages/statsmodels/tsa/base/
tsa_model.py:836: ValueWarning: No supported index is available.
Prediction results will be given with an integer index beginning at
`start`.
  return get_prediction_index(
/usr/local/lib/python3.10/dist-packages/statsmodels/tsa/base/tsa_model
.py:836: FutureWarning: No supported index is available. In the next
version, calling this method in a model without a supported index will
result in an exception.
  return get_prediction_index(

Performing stepwise search to minimize aic
 ARIMA(1,0,1)(0,0,0)[0]                : AIC=48.753, Time=0.03 sec
 ARIMA(0,0,0)(0,0,0)[0]                : AIC=44.753, Time=0.02 sec
 ARIMA(1,0,0)(0,0,0)[0]                : AIC=46.753, Time=0.02 sec
 ARIMA(0,0,1)(0,0,0)[0]                : AIC=46.753, Time=0.03 sec
 ARIMA(0,0,0)(0,0,0)[0] intercept    : AIC=38.915, Time=0.03 sec
 ARIMA(1,0,0)(0,0,0)[0] intercept    : AIC=38.434, Time=0.05 sec
 ARIMA(2,0,0)(0,0,0)[0] intercept    : AIC=40.300, Time=0.05 sec
 ARIMA(1,0,1)(0,0,0)[0] intercept    : AIC=40.378, Time=0.08 sec
 ARIMA(0,0,1)(0,0,0)[0] intercept    : AIC=38.923, Time=0.03 sec
 ARIMA(2,0,1)(0,0,0)[0] intercept    : AIC=41.079, Time=0.16 sec

Best model:  ARIMA(1,0,0)(0,0,0)[0] intercept
Total fit time: 0.524 seconds
Warning: Invalid prediction range for item B0CQVL6NXT. Skipping
forecast.
Performing stepwise search to minimize aic
 ARIMA(1,0,1)(0,0,0)[0]                : AIC=113.408, Time=0.04 sec
 ARIMA(0,0,0)(0,0,0)[0]                : AIC=126.990, Time=0.02 sec
 ARIMA(1,0,0)(0,0,0)[0]                : AIC=111.408, Time=0.02 sec
 ARIMA(0,0,1)(0,0,0)[0]                : AIC=114.425, Time=0.02 sec
 ARIMA(2,0,0)(0,0,0)[0]                : AIC=113.408, Time=0.03 sec
 ARIMA(2,0,1)(0,0,0)[0]                : AIC=115.354, Time=0.10 sec
 ARIMA(1,0,0)(0,0,0)[0] intercept    : AIC=104.425, Time=0.04 sec
 ARIMA(0,0,0)(0,0,0)[0] intercept    : AIC=107.095, Time=0.03 sec
 ARIMA(2,0,0)(0,0,0)[0] intercept    : AIC=104.717, Time=0.04 sec
 ARIMA(1,0,1)(0,0,0)[0] intercept    : AIC=105.322, Time=0.05 sec
 ARIMA(0,0,1)(0,0,0)[0] intercept    : AIC=103.323, Time=0.03 sec
 ARIMA(0,0,2)(0,0,0)[0] intercept    : AIC=105.322, Time=0.06 sec
 ARIMA(1,0,2)(0,0,0)[0] intercept    : AIC=106.119, Time=0.13 sec

Best model:  ARIMA(0,0,1)(0,0,0)[0] intercept
Total fit time: 0.637 seconds
Performing stepwise search to minimize aic
```

```
/usr/local/lib/python3.10/dist-packages/statsmodels/tsa/base/
tsa_model.py:836: ValueWarning: No supported index is available.
Prediction results will be given with an integer index beginning at
`start`.
  return get_prediction_index(
/usr/local/lib/python3.10/dist-packages/statsmodels/tsa/base/tsa_model
.py:836: FutureWarning: No supported index is available. In the next
version, calling this method in a model without a supported index will
result in an exception.
  return get_prediction_index(

 ARIMA(1,0,1)(0,0,0)[0]             : AIC=60.778, Time=0.04 sec
 ARIMA(0,0,0)(0,0,0)[0]             : AIC=56.778, Time=0.03 sec
 ARIMA(1,0,0)(0,0,0)[0]             : AIC=58.778, Time=0.03 sec
 ARIMA(0,0,1)(0,0,0)[0]             : AIC=58.778, Time=0.02 sec
 ARIMA(0,0,0)(0,0,0)[0] intercept   : AIC=48.680, Time=0.03 sec
 ARIMA(1,0,0)(0,0,0)[0] intercept   : AIC=47.888, Time=0.05 sec
 ARIMA(2,0,0)(0,0,0)[0] intercept   : AIC=48.908, Time=0.08 sec
 ARIMA(1,0,1)(0,0,0)[0] intercept   : AIC=inf, Time=0.27 sec
 ARIMA(0,0,1)(0,0,0)[0] intercept   : AIC=45.797, Time=0.04 sec
 ARIMA(0,0,2)(0,0,0)[0] intercept   : AIC=inf, Time=0.14 sec
 ARIMA(1,0,2)(0,0,0)[0] intercept   : AIC=inf, Time=0.28 sec

Best model:  ARIMA(0,0,1)(0,0,0)[0] intercept
Total fit time: 1.018 seconds
Performing stepwise search to minimize aic
 ARIMA(1,0,1)(0,0,0)[0]             : AIC=118.510, Time=0.08 sec
 ARIMA(0,0,0)(0,0,0)[0]             : AIC=130.365, Time=0.02 sec
 ARIMA(1,0,0)(0,0,0)[0]             : AIC=125.900, Time=0.02 sec
 ARIMA(0,0,1)(0,0,0)[0]             : AIC=128.335, Time=0.03 sec

/usr/local/lib/python3.10/dist-packages/statsmodels/tsa/base/
tsa_model.py:836: ValueWarning: No supported index is available.
Prediction results will be given with an integer index beginning at
`start`.
  return get_prediction_index(
/usr/local/lib/python3.10/dist-packages/statsmodels/tsa/base/tsa_model
.py:836: FutureWarning: No supported index is available. In the next
version, calling this method in a model without a supported index will
result in an exception.
  return get_prediction_index(

 ARIMA(2,0,1)(0,0,0)[0]             : AIC=120.456, Time=0.08 sec
 ARIMA(1,0,2)(0,0,0)[0]             : AIC=120.455, Time=0.10 sec
 ARIMA(0,0,2)(0,0,0)[0]             : AIC=127.342, Time=0.06 sec
 ARIMA(2,0,0)(0,0,0)[0]             : AIC=123.789, Time=0.03 sec
 ARIMA(2,0,2)(0,0,0)[0]             : AIC=122.447, Time=0.20 sec
 ARIMA(1,0,1)(0,0,0)[0] intercept   : AIC=117.656, Time=0.11 sec
 ARIMA(0,0,1)(0,0,0)[0] intercept   : AIC=117.104, Time=0.03 sec
 ARIMA(0,0,0)(0,0,0)[0] intercept   : AIC=115.588, Time=0.03 sec
```

```
 ARIMA(1,0,0)(0,0,0)[0] intercept   : AIC=116.978, Time=0.05 sec

Best model:  ARIMA(0,0,0)(0,0,0)[0] intercept
Total fit time: 0.856 seconds
Performing stepwise search to minimize aic
 ARIMA(1,1,1)(0,0,0)[0] intercept   : AIC=139.842, Time=0.07 sec
 ARIMA(0,1,0)(0,0,0)[0] intercept   : AIC=183.637, Time=0.01 sec
 ARIMA(1,1,0)(0,0,0)[0] intercept   : AIC=146.218, Time=0.04 sec

/usr/local/lib/python3.10/dist-packages/statsmodels/tsa/base/
tsa_model.py:836: ValueWarning: No supported index is available.
Prediction results will be given with an integer index beginning at
`start`.
  return get_prediction_index(
/usr/local/lib/python3.10/dist-packages/statsmodels/tsa/base/tsa_model
.py:836: FutureWarning: No supported index is available. In the next
version, calling this method in a model without a supported index will
result in an exception.
  return get_prediction_index(

 ARIMA(0,1,1)(0,0,0)[0] intercept   : AIC=inf, Time=0.18 sec
 ARIMA(0,1,0)(0,0,0)[0]             : AIC=181.637, Time=0.02 sec
 ARIMA(2,1,1)(0,0,0)[0] intercept   : AIC=inf, Time=0.29 sec
 ARIMA(1,1,2)(0,0,0)[0] intercept   : AIC=141.053, Time=0.13 sec
 ARIMA(0,1,2)(0,0,0)[0] intercept   : AIC=141.699, Time=0.09 sec
 ARIMA(2,1,0)(0,0,0)[0] intercept   : AIC=144.421, Time=0.05 sec
 ARIMA(2,1,2)(0,0,0)[0] intercept   : AIC=inf, Time=0.33 sec
 ARIMA(1,1,1)(0,0,0)[0]             : AIC=137.950, Time=0.04 sec
 ARIMA(0,1,1)(0,0,0)[0]             : AIC=141.373, Time=0.04 sec
 ARIMA(1,1,0)(0,0,0)[0]             : AIC=144.272, Time=0.03 sec
 ARIMA(2,1,1)(0,0,0)[0]             : AIC=138.322, Time=0.07 sec
 ARIMA(1,1,2)(0,0,0)[0]             : AIC=139.202, Time=0.08 sec
 ARIMA(0,1,2)(0,0,0)[0]             : AIC=139.772, Time=0.04 sec
 ARIMA(2,1,0)(0,0,0)[0]             : AIC=142.487, Time=0.03 sec
 ARIMA(2,1,2)(0,0,0)[0]             : AIC=inf, Time=0.27 sec

Best model:  ARIMA(1,1,1)(0,0,0)[0]
Total fit time: 1.827 seconds
Performing stepwise search to minimize aic
 ARIMA(1,0,1)(0,0,0)[0]             : AIC=39.199, Time=0.04 sec
 ARIMA(0,0,0)(0,0,0)[0]             : AIC=37.761, Time=0.02 sec
 ARIMA(1,0,0)(0,0,0)[0]             : AIC=37.495, Time=0.02 sec
 ARIMA(0,0,1)(0,0,0)[0]             : AIC=37.202, Time=0.02 sec
 ARIMA(0,0,2)(0,0,0)[0]             : AIC=39.199, Time=0.03 sec

/usr/local/lib/python3.10/dist-packages/statsmodels/tsa/base/
tsa_model.py:836: ValueWarning: No supported index is available.
Prediction results will be given with an integer index beginning at
`start`.
  return get_prediction_index(
```

```
/usr/local/lib/python3.10/dist-packages/statsmodels/tsa/base/tsa_model
.py:836: FutureWarning: No supported index is available. In the next
version, calling this method in a model without a supported index will
result in an exception.
  return get_prediction_index(

 ARIMA(1,0,2)(0,0,0)[0]              : AIC=inf, Time=0.20 sec
 ARIMA(0,0,1)(0,0,0)[0] intercept    : AIC=33.060, Time=0.04 sec
 ARIMA(0,0,0)(0,0,0)[0] intercept    : AIC=31.145, Time=0.03 sec
 ARIMA(1,0,0)(0,0,0)[0] intercept    : AIC=33.127, Time=0.03 sec
 ARIMA(1,0,1)(0,0,0)[0] intercept    : AIC=34.525, Time=0.23 sec

Best model:  ARIMA(0,0,0)(0,0,0)[0] intercept
Total fit time: 0.675 seconds
Performing stepwise search to minimize aic
 ARIMA(1,0,1)(0,0,0)[0]              : AIC=inf, Time=0.15 sec
 ARIMA(0,0,0)(0,0,0)[0]              : AIC=68.108, Time=0.01 sec

/usr/local/lib/python3.10/dist-packages/statsmodels/tsa/base/
tsa_model.py:836: ValueWarning: No supported index is available.
Prediction results will be given with an integer index beginning at
`start`.
  return get_prediction_index(
/usr/local/lib/python3.10/dist-packages/statsmodels/tsa/base/tsa_model
.py:836: FutureWarning: No supported index is available. In the next
version, calling this method in a model without a supported index will
result in an exception.
  return get_prediction_index(

 ARIMA(1,0,0)(0,0,0)[0]              : AIC=70.076, Time=0.03 sec
 ARIMA(0,0,1)(0,0,0)[0]              : AIC=70.087, Time=0.03 sec
 ARIMA(0,0,0)(0,0,0)[0] intercept    : AIC=63.728, Time=0.03 sec
 ARIMA(1,0,0)(0,0,0)[0] intercept    : AIC=64.064, Time=0.02 sec
 ARIMA(0,0,1)(0,0,0)[0] intercept    : AIC=64.358, Time=0.03 sec
 ARIMA(1,0,1)(0,0,0)[0] intercept    : AIC=65.924, Time=0.05 sec

Best model:  ARIMA(0,0,0)(0,0,0)[0] intercept
Total fit time: 0.363 seconds

/usr/local/lib/python3.10/dist-packages/statsmodels/tsa/base/
tsa_model.py:836: ValueWarning: No supported index is available.
Prediction results will be given with an integer index beginning at
`start`.
  return get_prediction_index(
/usr/local/lib/python3.10/dist-packages/statsmodels/tsa/base/tsa_model
.py:836: FutureWarning: No supported index is available. In the next
version, calling this method in a model without a supported index will
result in an exception.
  return get_prediction_index(
```

```
Performing stepwise search to minimize aic
 ARIMA(1,0,1)(0,0,0)[0]                    : AIC=114.127, Time=0.04 sec
 ARIMA(0,0,0)(0,0,0)[0]                    : AIC=128.087, Time=0.01 sec
 ARIMA(1,0,0)(0,0,0)[0]                    : AIC=113.115, Time=0.02 sec
 ARIMA(0,0,1)(0,0,0)[0]                    : AIC=120.479, Time=0.03 sec
 ARIMA(2,0,0)(0,0,0)[0]                    : AIC=113.568, Time=0.03 sec
 ARIMA(2,0,1)(0,0,0)[0]                    : AIC=115.279, Time=0.10 sec
 ARIMA(1,0,0)(0,0,0)[0] intercept   : AIC=110.931, Time=0.03 sec
 ARIMA(0,0,0)(0,0,0)[0] intercept   : AIC=116.647, Time=0.01 sec
 ARIMA(2,0,0)(0,0,0)[0] intercept   : AIC=112.399, Time=0.04 sec
 ARIMA(1,0,1)(0,0,0)[0] intercept   : AIC=112.692, Time=0.11 sec
 ARIMA(0,0,1)(0,0,0)[0] intercept   : AIC=113.556, Time=0.07 sec
 ARIMA(2,0,1)(0,0,0)[0] intercept   : AIC=113.979, Time=0.25 sec

Best model:  ARIMA(1,0,0)(0,0,0)[0] intercept
Total fit time: 0.774 seconds
Performing stepwise search to minimize aic

/usr/local/lib/python3.10/dist-packages/statsmodels/tsa/base/
tsa_model.py:836: ValueWarning: No supported index is available.
Prediction results will be given with an integer index beginning at
`start`.
  return get_prediction_index(
/usr/local/lib/python3.10/dist-packages/statsmodels/tsa/base/tsa_model
.py:836: FutureWarning: No supported index is available. In the next
version, calling this method in a model without a supported index will
result in an exception.
  return get_prediction_index(

 ARIMA(1,0,1)(0,0,0)[0]                    : AIC=17.613, Time=1.42 sec
 ARIMA(0,0,0)(0,0,0)[0]                    : AIC=13.613, Time=0.04 sec
 ARIMA(1,0,0)(0,0,0)[0]                    : AIC=15.613, Time=0.04 sec
 ARIMA(0,0,1)(0,0,0)[0]                    : AIC=15.613, Time=0.15 sec
 ARIMA(0,0,0)(0,0,0)[0] intercept   : AIC=13.311, Time=0.02 sec
 ARIMA(1,0,0)(0,0,0)[0] intercept   : AIC=14.786, Time=0.05 sec
 ARIMA(0,0,1)(0,0,0)[0] intercept   : AIC=inf, Time=0.32 sec
 ARIMA(1,0,1)(0,0,0)[0] intercept   : AIC=inf, Time=0.31 sec

Best model:  ARIMA(0,0,0)(0,0,0)[0] intercept
Total fit time: 2.392 seconds
Performing stepwise search to minimize aic

/usr/local/lib/python3.10/dist-packages/statsmodels/tsa/base/
tsa_model.py:836: ValueWarning: No supported index is available.
Prediction results will be given with an integer index beginning at
`start`.
  return get_prediction_index(
/usr/local/lib/python3.10/dist-packages/statsmodels/tsa/base/tsa_model
.py:836: FutureWarning: No supported index is available. In the next
version, calling this method in a model without a supported index will
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result in an exception.
  return get_prediction_index(

 ARIMA(1,0,1)(0,0,0)[0]                : AIC=inf, Time=1.32 sec
 ARIMA(0,0,0)(0,0,0)[0]                : AIC=39.886, Time=0.03 sec
 ARIMA(1,0,0)(0,0,0)[0]                : AIC=41.719, Time=0.02 sec
 ARIMA(0,0,1)(0,0,0)[0]                : AIC=41.794, Time=0.06 sec
 ARIMA(0,0,0)(0,0,0)[0] intercept      : AIC=33.713, Time=0.06 sec
 ARIMA(1,0,0)(0,0,0)[0] intercept      : AIC=31.815, Time=0.04 sec
 ARIMA(2,0,0)(0,0,0)[0] intercept      : AIC=33.513, Time=0.04 sec
 ARIMA(1,0,1)(0,0,0)[0] intercept      : AIC=inf, Time=0.17 sec
 ARIMA(0,0,1)(0,0,0)[0] intercept      : AIC=inf, Time=0.11 sec
 ARIMA(2,0,1)(0,0,0)[0] intercept      : AIC=inf, Time=0.25 sec

Best model:  ARIMA(1,0,0)(0,0,0)[0] intercept
Total fit time: 2.114 seconds

/usr/local/lib/python3.10/dist-packages/statsmodels/tsa/base/
tsa_model.py:836: ValueWarning: No supported index is available.
Prediction results will be given with an integer index beginning at
`start`.
  return get_prediction_index(
/usr/local/lib/python3.10/dist-packages/statsmodels/tsa/base/tsa_model
.py:836: FutureWarning: No supported index is available. In the next
version, calling this method in a model without a supported index will
result in an exception.
  return get_prediction_index(

forecast_df = pd.DataFrame(all_forecasts)
```

OUTPUT

```
print(forecast_df.head())

        date       Item Id  TARGET
0  2024-07-01  B09KDTS4DC       3
1  2024-07-02  B09KDTS4DC       3
2  2024-07-03  B09KDTS4DC       3
3  2024-07-04  B09KDTS4DC       3
4  2024-07-05  B09KDTS4DC       4

forecast_df.to_csv('Task1_output.csv', index=False)
```