Exploring techniques to forecast monthly Irish milk sales using time series analysis

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V1.0

Environment:

Python Version 3.12.2 (main, Sep 6 2024, 08:07:10) [MSC v.1929 64 bit (AMD64)]

Jupyter notebook

Required Libraries:

```
import numpy as np
import pandas as pd
import matplotlib.pyplot as plt
import seaborn as sns
import statsmodels.api as sm
from statsmodels.tsa.seasonal import seasonal_decompose
from statsmodels.tsa.stattools import adfuller
from statsmodels.tsa.statespace.sarimax import SARIMAX
from statsmodels.graphics.tsaplots import plot_acf, plot_pacf
from pandas.plotting import autocorrelation_plot
from sklearn.metrics import mean_squared_error, r2_score, mean_absolute_error,
median_absolute_error, mean_squared_log_error
!pip install pmdarima --quiet
import pmdarima as pm
```

Dataset:

Publicly available dataset CSV file of Irish milk sales has been provided in the attachment (AKM02.20241222170131.csv)

How to run the code?

1) Jupyter notebook (x23272473_PoAI_TABA.ipynb) has been provided in the attachment. Open the notebook in the editor.

2) Keep the dataset (AKM02.20241222170131.csv) at the specified path in the folder in your system (Make sure the CSV file in unlocked and a user has full access to access and use it)

3) In the jupyter code, at 2 places, we are saving the files at specified in the local drive, those files are i) CSV dataset file after processing and ii) Forecasting image: Just update those paths according to your computer folder setup

4) Run the file

Note : Make sure the same model parameters provided by Auto-Arima model are being passed to SARIMAX model in the jupyter notebook.