WALMART TIME-SERIES ANALYSIS

01. WALMART

Walmart is a global retail giant with a vast network of stores and a wide range of products. Effective inventory management and sales prediction are critical for Walmart's operations. Our project focuses on leveraging time series forecasting techniques to optimize these processes.

ARIMA

- ARIMA stands for "AutoRegressive Integrated Moving Average". It's a statistical model that uses time series data to understand data sets and predict future trends. ARIMA is used in statistics and econometrics to measure events that happen over time.

FB PROPHET

- FBProphet is a powerful time series forecasting algorithm that can capture complex patterns in the data such as seasonality, trends, and the effect of holidays. It is based on a Bayesian approach that allows for uncertainty estimation in the predictions.

SARIMA

- SARIMA (Seasonal Auto-Regressive Integrated Moving Average) is an extension of the ARIMA (Autoregressive Integrated Moving Average) model that incorporates seasonality in addition to the non-seasonal components, it explicitly supports univariate time series data with a seasonal component.

METHODOLOGY
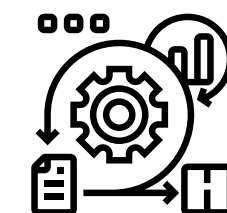
1. **Data Collection and Preparation**
   - Source: Kaggle
   - Collection: Acquired time series data from Walmart on Kaggle.
   - Preparation: Cleaned and processed data, handling null values and ensuring data quality.
2. **Exploratory Data Analysis (EDA)**
   - Tools: Python (Pandas, NumPy, Matplotlib, Seaborn,)
   - Analysis: Data cleaning, feature engineering, and exploration of patterns, trends, and insights through the use of various graphs and charts with Plotly.
3. **Model Training and Forecasting**
   - Models: ARIMA, SARIMAX, FB Prophet
   - Procedure: Split data into training and testing sets, trained time series models to capture different aspects of the data.
4. **Database**
   - System: Postgre SQL
   - Integration: Implemented PostGRE SQL on the backend for efficient storage, retrieval, and management of time series data.
5. **Dashboard**
   - Tool: PowerBi
   - Integration: Rendered data from PostGRE in PowerBi to create an insightful dashboard for comprehensive analysis.

OBJECTIVE

- Accurate Sales Forecasting.
- Optimized Inventory Levels.
- Enhanced Decision Making.
- Improved Customer Service.
- Customer Segmentation and Behavior Analysis

TECHNOLOGIES

- Kaggle
- Python
- ARIMA, SARIMA, FB PROPHET
- Postgre SQL
- PowerBi

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