

Dominos - Predictive Purchase Order System

Skills Acquired from This Project

Data cleaning and preprocessing

Exploratory Data Analysis (EDA)

Time series forecasting

Predictive modeling

Business decision-making

Real-world application of data science

Domain

Food Service Industry

Problem Statement

Dominos aims to optimize the process of ordering ingredients by predicting future sales and creating a purchase order. By accurately forecasting sales, Dominos can ensure that it has the right amount of ingredients in stock, minimizing waste and preventing stockouts. This project leverages historical sales data and ingredient information to develop a predictive model and generate an efficient purchase order system.

Business Use Cases

Inventory Management: Ensuring optimal stock levels to meet future demand without overstocking.

Cost Reduction: Minimizing waste and reducing costs associated with expired or excess inventory.

Sales Forecasting: Accurately predicting sales trends to inform business strategies and promotions.

Supply Chain Optimization: Streamlining the ordering process to align with predicted sales and avoid disruptions.

Approach

Data Preprocessing and Exploration

Data Cleaning:

Removed missing or inconsistent data entries.

Handled outliers.

Formatted the data appropriately.

Exploratory Data Analysis (EDA):

Analyzed sales trends, seasonality, and patterns in historical sales data.

Visualized the data to identify significant features.

Sales Prediction

Feature Engineering:

Created relevant features from the sales data such as:

Day of the week

Month

Promotional periods

Holiday effects

Model Selection:

Chose appropriate time series forecasting models, including:

ARIMA

SARIMA

Prophet

LSTM

Regression Model

Model Training:

Trained the predictive model on historical sales data.

Model Evaluation:

Utilized Mean Absolute Percentage Error (MAPE) to evaluate model performance.

Purchase Order Generation

Sales Forecasting:

Predicted pizza sales for the next week using the trained model.

Ingredient Calculation:

Calculated the required quantities of each ingredient based on the predicted sales and ingredient dataset.

Purchase Order Creation:

Generated a detailed purchase order listing the quantities of each ingredient needed for the predicted sales period.

Results

Accurate Sales Predictions: The models provided reliable forecasts for pizza sales.

Comprehensive Purchase Order: A detailed purchase order was generated, listing the required ingredients for the forecasted sales period.

Technical Tags

Data Cleaning

EDA

Time Series Forecasting

ARIMA/SARIMA/Prophet/LSTM/Regression Model

Predictive Modeling

Inventory Management

Python

Pandas

Scikit-learn

Matplotlib/Seaborn

Datasets

Dataset Link:

Sales Dataset

Ingredients Dataset

Dataset Explanation:

Sales Data: Historical sales records containing:

Date

Pizza Type

Quantity Sold

Price

Category

Ingredients

Ingredient Data: Ingredient requirements for each pizza type, including:

Pizza Type

Ingredient

Quantity Needed

Conclusion

The project successfully demonstrated the ability to predict sales for Dominos, allowing for efficient inventory management and reduced costs associated with ingredient ordering. By leveraging historical data and applying predictive modeling techniques, Dominos can optimize its supply chain operations, leading to improved business performance.