MADHOUSE HP ANALYTICS

Unleash the Power of Data at Madhouse: HP Analytics - Revolutionizing Inventory Management and Forecasting!

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DATA PIPELINE

01
PREPROCESS

- Data cleaning (e.g.: drop NAs for both sales and inventory NAs)

- Feature extraction (e.g.: yearweek => year and week)

02
EXPLORATORY DATA ANALYSIS

- Understand and analyse data patterns (like for each product, segment etc.)

- Exploring vendor correlations per product and period

03
CLUSTERING

- To identify potential new groupings due to the product categories/segment not being as representative

- Applied both K-Means & Gaussian Mixture Models

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DATA PIPELINE

04
TRANSFORMATION

- Apply transformation (log) for both sales and inventory units to deal with skewed distribution (outliers)

05
DATA IMPUTATION

- Firstly, tested basic imputation methods (mean, median)

- Then, used KNN to impute missing values where either sales or inventory were null

06
VENDOR & CLUSTER AGGREGATION

- Aggregate (sum) sales & inventory for all vendors per product & week

- Aggregate (median) per cluster as well

DATA PIPELINE

07

TIME SERIES FORECASTING

- Converted data to a time-series dataset (indexing on date, i.e. x-axis and sales/inventory on y-axis)

- Train and validation split before testing on provided test data for the next 13 weeks

- Analyze trend, seasonality and overall pattern for each (cluster, sales/inventory)

- Applied two levels of differencing to deal with trends and any existing seasonality

- Used ADF test to confirm stationarity of time-series

- Checked ACF and PACF plots for identifying order of MA and AR

- Used Auto-ARIMA to loop through many combinations of ARIMA orders, and identify best model by reducing AIC and BIC

- Predicted validation set and calculated RMSE

- Aggregated RMSEs over all clusters and sales/inventory to obtain our model's final RMSE

WEB APPLICATION

✓ USER FRIENDLY INTERFACE

✓ EASY TO DEPLOY CONTAINER APPLICATION

✓ TWO-IN-ONE DASHBOARD FOR HISTORICAL OVERVIEW AND FORECASTING

✓ TWO-IN-ONE DASHBOARD FOR HISTORICAL OVERVIEW AND FORECASTING

✓ SIMPLE GRAPH VISUALISATIONS FOR DATA EXPLORATORY AND ANALYSIS