DemandEst - AI powered Food Demand Forecaster

Brainstrom & idea prioritization

15 minutes to prepare
30-60 minutes to collaborate
4 People

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1 Problem Statement

To develop a machine learning model to forecast the number of orders to gather raw materials for next ten weeks.

5 minutes

PROBLEM

How can we develop **Machine learning model to forecast the number of orders to gather raw materials for next ten weeks?**

Key rules of brainstorming
To run an smooth and productive session

- Stay in topic.
- Encourage wild ideas.
- Defer judgment.
- Listen to others.
- Go for volume.
- If possible, be visual.

2 Brainstorm

Write down all innovative ideas as it comes addressing the problem statement.

10 minutes

Akil R M

- The Demand Estimation we provide must be efficient that in makes the process of making meaningful decisions in the enterprise level easier.
- Algorithmic and model-based improvements require greater technical expertise, intuition and understanding of the use case.
- Without a proper understanding for the nuances of the given data, it is nearly impossible to build an effective, generalised model.
- The existing systems mostly use ARIMA models and Exponential smoothing to address the problem

Dharaneesh G S

- The data available and the goal are the first steps towards deciding on an approach.
- It's important to think critically about what a given problem entails.
- Improving machine learning models to attain a better accuracy can be perfected by systematically addressing the deficiencies of the current model.
- Understanding the data and the relationship present within it is just as important as any algorithm used to train the machine learning model.

Janarthanan D

- Keeping track of the machine learning experiments is key to reproducing them at any point in time.
- Understanding and knowing the evaluation metric is important to measure the model performance
- Understand the dataset for the features that greatly contribute to the end estimation.
- The model is continuously monitored for model drift so that it stays accurate and effective.

Sanjay Krishnan R

- Plan a clear flow to make the model-building process as well-defined as possible.
- Data augmentation techniques can be leveraged to expand the training dataset in a scalable fashion.
- Focus on optimising the configuration to bring the most benefit.
- Model-building phase is to reassess the goals that targeted in the first step to determine if they are feasible.

3 Group Ideas

Take turns sharing your ideas while clustering similar or related notes as you go. In the last 10 minutes, give each cluster a sentence-like label. If a cluster is bigger than six sticky notes, try and see if you and break it up into smaller sub-groups.

20 minutes

Features & Extraction

- To normalise, fill missing values and encode categorical variables to make the model easily understand the dataset
- Dimensionality reduction of the feature space to achieving better performances by the model
- Increase the accuracy of learned models by extracting features from the input dataset
- The data must be visualised using techniques like box/scatter plots in order to identify and remove outliers

Model

- To forecast Bayesian Linear Regression, Support Vector Machine, Lasso Regression, XGB Regressor models can be used
- The existing systems use ARIMA, Exponential Smoothing, Holt-Winters, Decision Tree Classifier models to forecast
- Decision tree regressor observes the features of an entity and trains a model in the structure of a tree to forecast and produce meaningful continuous output
- Random Forest relies on a number of decision trees and uses mean prediction for the ultimate result

Classification

- Classification predicts the categorical labels of data with the prediction models.
- The goal of classification is to accurately predict the target class for each case in the data.
- A classification model tries to draw a conclusion from the input values given for training. It will predict the class labels/ categories for the new data.
- Demand classification analyzes demand patterns to improve forecast accuracy.

Approach

- Using the time series approaches, the forecast is produced using the past recorded demand as input in order to forecast
- When mixed approaches are used, the forecasting method exploits both incoming information from recorded past demand and the predictor variables available in the dataset
- XGBoost, an implementation of gradient boosted decision trees, uses decision tree methods to supply high performance with very less computation time, leading to better performances
- Quantitative forecasting techniques and qualitative forecasting techniques are used to identify the demand for the raw materials

4 Prioritize

So as to make sure that all the teammates are at the same page, place your ideas on this grid to determine which ideas are important and which are feasible

20 minutes