

Distributed Food Price Prediction for Kenyan Markets

Background/ Context

The Kenyan Food market often faces uncertain conditions that impose a risk of loss on the farmers also leading to exploitation of the buyers. This is caused by environmental factors such as unpredictable rainfall rates, extreme temperatures that are not favorable, natural calamities such as locust invasions and, unpredictable inflation rates among others. This calls for the development of a cutting-edge distributed system that will use the above-mentioned factors to predict food prices for Kenyan markets.

Objectives

1. To enhance Food Security.
2. To support Farmers in decision making.
3. To create consumer awareness.
4. To ease policy making by government business agencies.

Methodology

For the development of the system bulk data is required for training and testing the distributed model. Data sources include World Food Program Database (Historical Food Prices data for Kenya), KilimoStat API (Kenya Ministry of Agriculture and Livestock Development) for Agricultural Production rates in Kenya and Weather Data obtained from Kenya Meteorology Department Database.

After cleaning the dataset, we will utilize PySpark and MLlib for training the model, measure the model accuracy using metrics such as Mean Absolute Error and save the model if the accuracy is high. Then we will create flask app to serve the model and streamlit for the frontend. We'll containerize and ship the app with docker for deployment in Azure Kubernetes Service (AKS)

Results

We expect that the system will accurately predict short-term and long-term food prices trends across various Kenyan Markets.

Conclusion

Utilization of a distributed framework in the forecasting of food prices in Kenya can potentially enhance the efficiency and responsiveness of the players in the agricultural market. By enabling it to keep data private and leverage heterogeneous datasets, the DML model is a good solution to the food price volatility problem.

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