

Predicting Rice Prices in the Philippines Using Different Machine Learning Models

Mini-project by Custodio, Dordas,
and Quitoviera





Background

Rice is a staple food in every meal of Asian households, especially in the Philippines. It meets half the required calorie intake that the human body needs in order to survive and function daily.

So why predict rice prices?

- Ensure food security
- Can be utilized by the government in **managing and controlling price increases**. At the same time, maximize profits and minimize risks.



Objective

The researchers aim to **find the best machine learning model** between **linear regression**, **lasso regression**, and **XGBoost** in **making rice price predictions in the Philippines.**



Materials and Methods

ABOUT THE DATA SET:

- Entitled as “Philippines - Food Prices” from The Humanitarian Data Exchange website (from the January 15, 2000 up to March 15, 2022).



Experimental Process ✨

- 1 Implement Linear Regression (Least Squares Approach)
- 2 Implement Lasso Regression (Least Absolute Shrinkage and Selection Operator)
- 3 Implement XGBoost (Extreme Gradient Boosting)
- 4 Evaluate the three models and compare their scores



Implementation

Experimental Setup

1

Data is pre-processed and the significant features to use in the study are chosen via feature selection

2

Splitting the data set into training and testing sets

3

Fitting the data sets into the three models

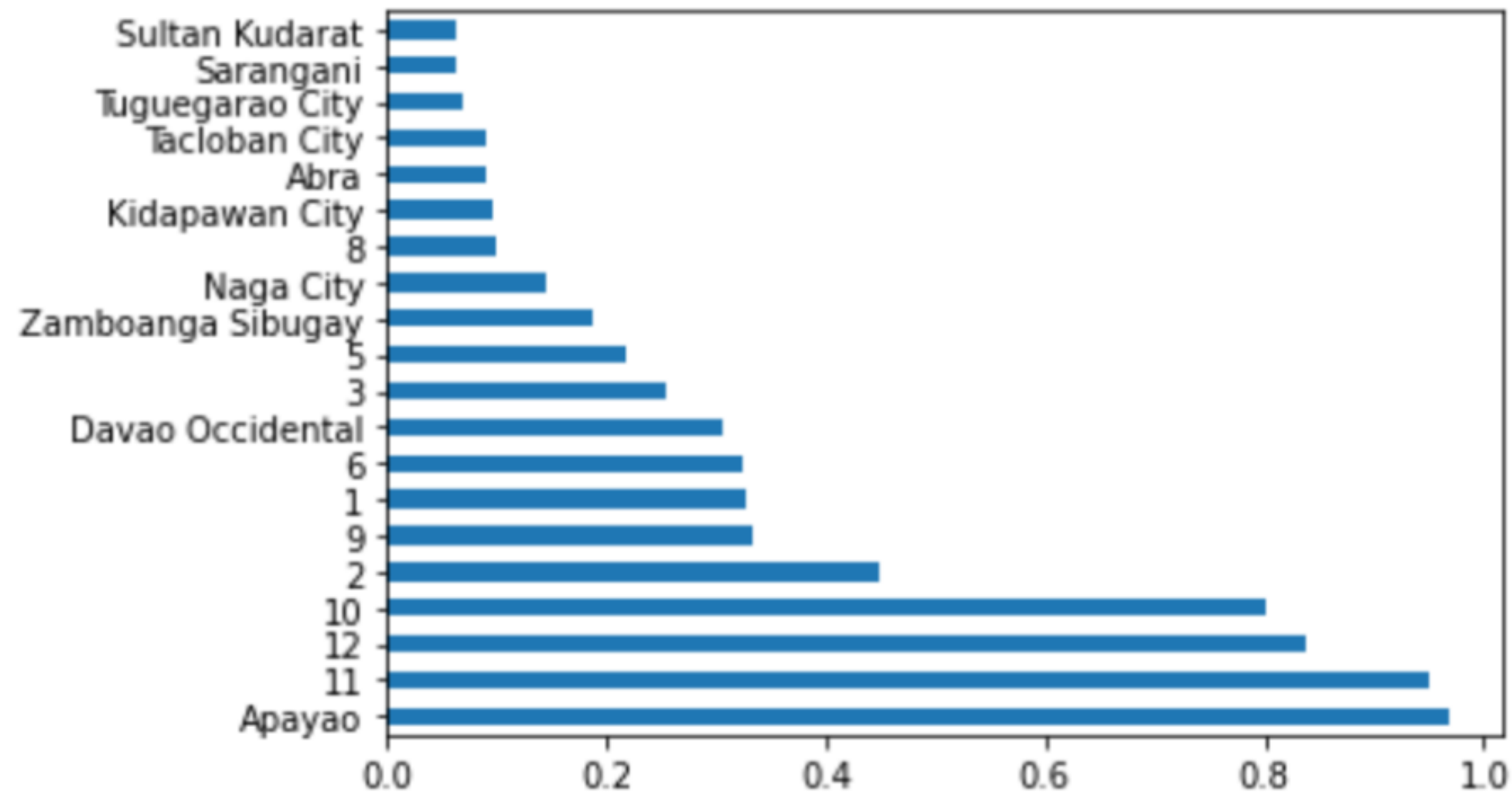
4

Evaluating the performance of models using the following metrics: R^2 , RMSE, and MAPE

5

Comparing R^2 , RMSE, and MAPE scores of the models

Feature Selection ✨



Columns
selected:

- Month
- Market (City)
- District

Feature Selection from Pre-Processing

Results and Analysis

	R^2	NRMSE	MAPE
Linear Regression	0.906750	0.165327	0.075292
Lasso Regression	0.851363	0.263526	0.088143
XGBoost	0.961006	0.069134	0.048905

Table 1. Table of Evaluation Scores of Training Sets

	R^2	NRMSE	MAPE
Linear Regression	0.899144	0.192580	0.076494
Lasso Regression	0.854007	0.278765	0.088606
XGBoost	0.938575	0.117288	0.060981

Table 2. Table of Evaluation Scores of Testing Sets

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Conclusion

The experimental result showed that **XGBoost was the model that provided the best accuracy values.**

It has the **highest R2 value** and **lowest RMSE, NRMSE, MAE, and MAPE values** compared to Linear Regression and Lasso Regression.

Conclusion ✨

1

The model determined that as the year progresses, the rice price also increases

2

It can help the government implement policies on how to manage the price increase of rice

3

People can prepare their expenses as they have an idea on the expected prices.

Recommendation



1

Try other machine learning models

2

Future studies of similar topics can attempt the models on other commodities and not only rice

Thank You
Mga Ka-rice Lovers!

