

FOOD STOCK DEMAND FORECAST

Group 081: Dino Bots



Stop Food Wastage, Please?

DID YOU KNOW?

In Singapore,

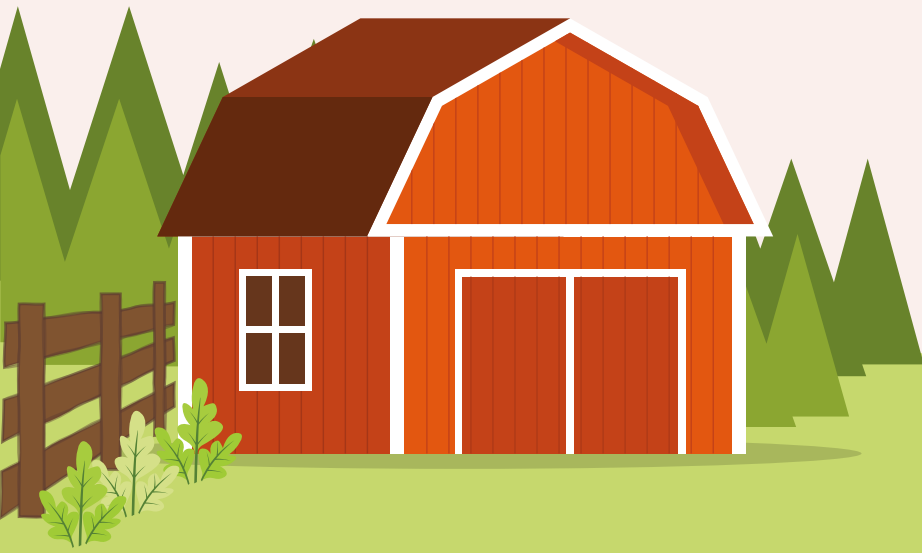
The amount of food waste generated has grown by around 20% over the last 10 years. In 2019, Singapore generated around 744 million kg of food waste.

That is equivalent to 2 bowls of rice per person per day*.



* <https://www.towardszerowaste.gov.sg/foodwaste/>

WHAT WE AIM TO DO!



So what we want to do?

Our team would like to use Time Series Forecasting which implements Machine Learning to predict future food demand.

Beyond the lowest demand before its expiry date, these products could be donated to families who are in need

How do we use it?

Users can input their past sales record over a period of time and see how much demand for food they can expect. Then, donate the food to families in need when they are the lowest demand near the expiry date.

How is it beneficial?

Knowing the demand for different categories of food, retailers are able to better determine their inventory stock and decide accurately how much produce is need, minimising potential food wastage.

When the demand is the lowest and the probability of customers purchasing is low, these food could be reallocated to families in need instead of going bad and wasting them.

TIME SERIES FORECASTING

Step 1

Load groceries data into pandas dataframe

Step 2

Clean the data and process the data into useable dataframe

Step 3

Use ARIMA to build a model to forecast future food demand

Step 4

Usage of web application to plot future food demand in a graph and save it as a png

Step 5

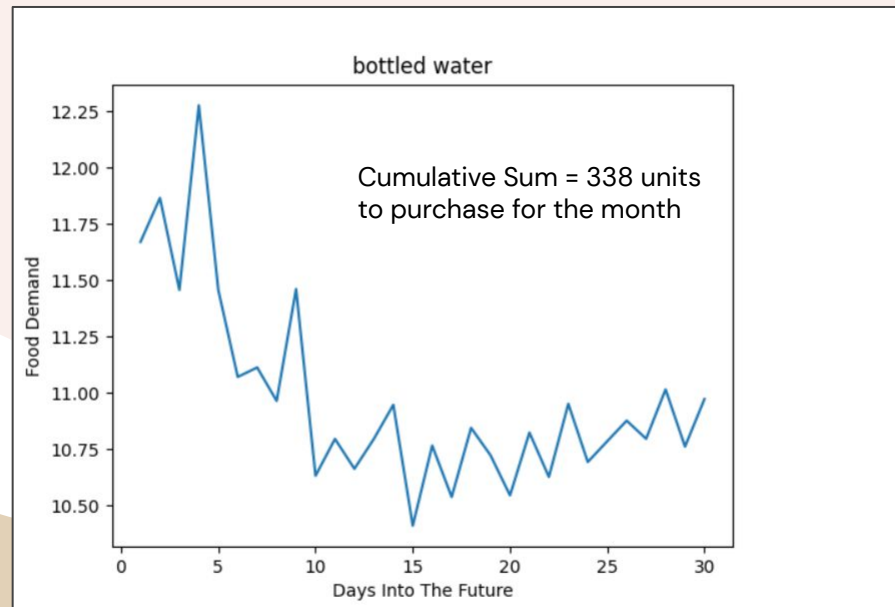
Using ML to better estimate the lowest demand before expiry date to be delivered to families



SOLUTION ONE

Quantity of products to purchase

- By forecasting future demand of the product, companies can determine the quantity to purchase
- Reduce the likelihood of over-stockpiling of products
- Tackles the issue of food wastage at its roots



SOLUTION TWO

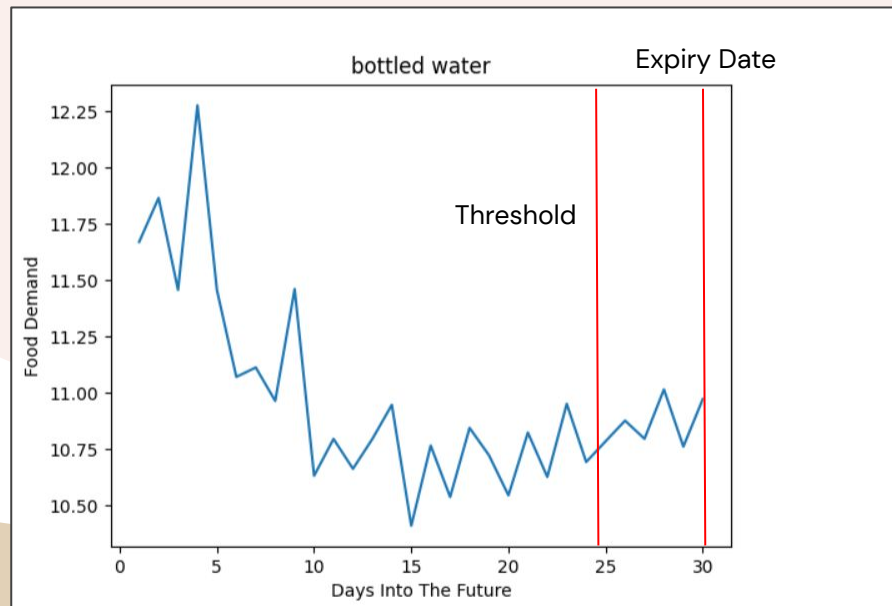
Determine the threshold for product to be donated



By plotting the forecasted demand based on days into the future, we can **establish the nth-day** where the **demand becomes too low for any commercial value**



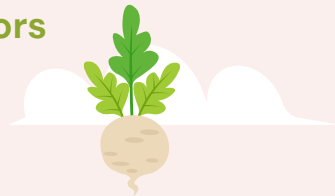
This value, n , will be used to determine the threshold (date for the product to be donated)



FUTURE POTENTIAL IMPROVEMENT

1. Improving our Machine Learning Algorithm to account for other factors

- 🍏 For instance seasonalities, trends, cyclical events
- 🍏 Better forecast of product demand



2. Creating an Artificial Intelligence that can determine the optimal date (before expiry date) to remove the product from the shelf

- 🍏 Collection of more data (i.e. production date, expiry date)
- 🍏 Determine the duration of product shelving to maximise the producer's profits as well as establish a middle ground to benefit families who are in need





🍏 THANK YOU!