Winjit

Rainfall Impact on Commodity Pricing

Introduction

Commodity losses in inundate quantities are suffered due to unforeseen changes in rainfall every year. However, if attention is paid by observing the rainfall patterns of previous years, a dedicated system can be designed to predict the price of various commodities with the given input of rainfall.

> This case study showcases how Winjit's Machine Learning algorithm was developed for a similar scenario, where with the given inputs of-month, year and rainfall, prices of different commodities were predicted.

Customer

The client runs a chain of cold storages in India. The organization is known for its expertise in the domain. It caters to markets in all the states of India, and takes call when to release the commodities in market and till when to put them on hold. Such an effort helps the organization to maximize its profits as well as those of the farmers.

From past 2 year, the client's profits were declining due to unpredicted rainfall. Hence, the client sought for a solution where by using the previous trends in rainfall, present and future calls could be made to get the maximum returns.

Requirement

To get aligned with the exact needs of the client, Winjit's Machine Learning team identified the key requirements as:

- Creation of a database, uploading previous

rainfall patterns over years

- Creating Price log of different commodities in different months of a year
- Implementing regression technique for prediction
- Training the system with pre-processed data

Challenges

Predicting the prices of different commodities just on the inputs- month, year and estimated rainfall, was a very complex task. Dedicated techniques were applied to achieve this. Agriculture is a sector which is seasonally dependent. Identifying the seasonal growth of various commodities and integrating that data with the rainfall across different regions was a major challenge that the team faced.

Solution

The solution developed by Winjit's ML team helped in predicting the prices of the commodities based on the impact of rainfall. Various machine learning algorithms were tested and the one which delivered the best results was selected.

Data for training the classifier was collected from agmarket.gov.in and mahagovt.gov.in. Data related to the pricing of different commodities was acquired from agmarket.gov.in and data related to the rainfall from mahagovt.gov.in. Attributes of the data collected was organized on monthly and yearly basis to maintain history of the prices and rainfall.

After collecting the data and loading it in a database, data pre-processing was done using the preprocessing package in python. To overcome the challenge of seasonal nature of rains as well as commodities, One Hot Encoding was performed on the dummy variables.

Regression technique was performed for training and testing of the data. Random forest aggression technique was used for predicting the commodity price on the basis of rainfall.

Finally, input was taken from the user for entering the month, year and estimated rainfall. Then the user was asked to select the commodity for which he desired to know the prices and the corresponding result was shown.

Achievements & Benefits

- Deviation of predicted and actual results was not more than 10%
- By making the right calls using the predicted values, the losses of the client were minimised.
- The solution was applicable to whole agricultural sector, which helped the industry in minimising their losses.
- Price prediction of the commodities using the rainfall also led to better planning and management of the resources

Conclusion

Using machine learning, a solution was developed for the client which not only helped him in minimising his losses, but helped the entire industry. The predicted values emerged to be close to actual values which helped the entire agriculture chain with better planning of their resources.

Winjit technology is India's leading provider of innovative engineering solutions. Since its inception in 2004, Winjit has built and expanded its expertise in latest trending technologies including Internet of Thing, Artificial Intelligence & Machine Learning, Fintech Solutions, Product engineering and Digital publishing. Winjit provides end-to-end solutions from conceptualization and optimization to providing real-time solutions by developing software systems for any business is these fortes. Over the past decade, Winjit has provided innovative technology and engineering solutions that has resulted in world-class recognition and long standing customers.

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