PROBLEM STATEMENT

TITLE: ESTIMATION OF CROP YIELD USING DATA ANALYSIS

IDEAL SOLUTION :

It's not a coincidence that the science of teaching computers to learn and create models for predictions is so widely applied. The global economy depends heavily on the agricultural sector. Understanding global agricultural output is essential to addressing issues of food security and minimising the effects of climate change as the human population continues to grow.

Predicting crop yields is a significant agricultural issue. Weather factors (rain, temperature, etc.), as well as pesticides, are the main determinants of agricultural productivity. Making judgments regarding agricultural risk management and forecasting requires accurate knowledge of crop yield history.

Although food is prepared very differently all around the world, the fundamental elements that keep people alive are quite similar. We consume large amounts of rice, corn, wheat, and other basic crops. In this project, the World Data Bank and FAO make their publicly available data used to anticipate the ten most eaten crops.

Regression analysis is a type of predictive modelling technique that looks at how an independent variable (s) and a dependent variable (target) are related (predictor). The project's regression models

- Gradient Boosting Regressor
- Random Forest Regressor
- SVM
- Decision Tree Regressor

It is the proportion of the variance in the dependent variable that is predictable from the independent variable, where it is a statistical measure between 0 and 1 which calculates how similar a regression line is to the data it’s fitted to. If it’s a 1, the model 100% predicts the data variance; if it’s a 0, the model predicts none of the variance.

Factors include humidity, sunlight and factors involving the climate. Environmental factors refers to soil conditions. In this model two climate and one environmental factors are selected, rain and temperature. In addition to pesticides that influence plant growth and development. Rain has a dramatic effect on agriculture, for this project rainfall per year information was gathered from the World Data Bank in addition to average temperature for each country.

REALITY:

In order to address issues with food security and lessen the effects of climate change, it is essential to comprehend global agricultural productivity. One of the top UN Sustainable Development Goals for 2030 is to end hunger, and this goal can assist. In the project, we present a scalable, precise, and low-cost approach to agricultural production prediction utilising openly accessible remote sensing data and machine learning. Several months prior to harvest, our deep learning system can estimate crop yield using just globally accessible covariates with high spatial resolution (county-level). We think our technique may be useful for setting suitable food reserve levels, identifying low-yield locations, and enhancing risk management of derivatives related to crops.

PROBLEM STATEMENT:

Machine Learning based on prior crop prediction, soil quality analysis to achieve high crop yield through out technology solution. The main objectives of this project is to predict crop-yield which can be extremely useful to farmers in planning for harvest and sale of grain harvest.

Agriculture analysis is a very important aspect to crop growing. To increase quality and yields, it is crucial to understand the current nutrient levels of the soil to be able to ascertain which areas require improvement. Our LaquaTwin range of portable meters can provide in-field analysis in your pocket. Analyze pH to check for soil acidity and alkalinity, Conductivity to determine optimised fertilizer usage as well as Sodium, Potassium, Nitrate and Calcium levels. The LaquaTwin range can empower you with the analytical data to make the right choices for your growing application.

Increasing crop yields is a high priority for growers. Our Fluorescence Spectroscopy instruments can be advantageous to help predict current yield factors and indicate on how to salvage a stressed or poor performing crop. Our FluoroLog Spectrofluorometer is ideal to perform this type of agriculture analys and provide such crop yield indicators.

ICP-OES is an analytical technique that is widely utilized throughout the agricultural industry and within research and development institutions. It is an ideal agriculture analysis technique to determine major and minor elements in soils and plants as well as detecting heavy metal contents. Our Ultima has been used in many crop science institutions to undertake such important content detection.

Fertilizer manufactures understand the importance of particle size. It directly affects certain aspects including release rates, fertilizer potency and also hazardous dust generation. To ensure quality and consistency, a minimum frequency of measurements must be made and our Particle Analyzers are ideal for this task.

CONSEQUENCES:

The crop maize, often known as corn, is farmed all over the world, with regions closer to the equator producing the bulk of the crop. As average temperatures rise in these breadbasket countries, greater stress will be placed on the plants, which might lead to a drop in maize yields across North and Central America, West Africa, Central Asia, Brazil, and China in the upcoming years and beyond.

As temperatures rise, a wider region, including the Northern United States and Canada, the North China Plains, Central Asia, Southern Australia, and East Africa, may be able to grow wheat, which thrives in moderate climes. However, these gains may level off by the middle of the century. The models don't just focus on temperature while simulating

CONCLUSION:

In conclusion, the introduction of technology into the agricultural sector has led to a minor rise in productivity. Technology improvements have made new concepts like precision agriculture, smart farming, and digital agriculture viable. In the literature, it has been highlighted that assessments of agricultural productivity, the discovery of concealed patterns using data sets connected to seasons and crop yields data, have been carried out. We have observed and analysed the several crops that are grown, as well as their area and production rates in various states and districts, using IBM Cognos. A few of these are:

Production-rate averaging seasons. This analytics teaches us which seasons experience a rise in productivity on average and which experience a drop. Yield-average seasons.

Our understanding of which seasons see an increase in average productivity and which experience decreases comes from this data. Production, second, by crop year. Our goal in conducting this research is to boost crop productivity.