Ideation Phase
Literature Survey

Date	13 October 2022
Team ID	PNT2022TMID10712
Project Name	Exploratory Analysis of RainFall Data in India for Agriculture
Maximum Marks	2 Marks

Literature Survey:

ABSTRACT:

We use APPLIED DATA SCIENCE to solve this problem. There are so many algorithms available such as Decision tree, Random Forest, KNN, Xgboost, etc. We will test and train the data with one of these algorithms. From these, the best algorithm is selected, and the model is being developed. We visualize the datas and models. The results provide us various evaluation metrics of the Machine Learning techniques.

INTRODUCTION:

Weather conditions changes then and often. This can lead to Severe threats to all the living beings including human beings. So, predicting weather, especially Irregular heavy rainfall can cause huge floods and economic losses. This also decreases crop productivity and may lead into Food shortage. Predicting the Rainfall plays a vital role in our lifetime. Farmers will get benefit due to this and Our country's GDP will rise. Earth's temperature has been relatively constant over many centuries as the incoming solar energy was nearly in balance with outgoing radiation. But after 1750, the unscrupulous industrial emissions and pollutants have altered the energy balance of atmosphere by absorbing the outgoing radiation and made the Earth warmer by 0.85^{o}C. This trend is going to aggravate as the annual mean surface air temperature is projected to rise up to 3.7^{o}C by the end of this century based on different Representative Concentration Pathway (RCP) Scenarios. Collection of previous 10 years data may give us an idea about the pattern of Rainfall. Using all these Datas, Appropriate farming activities can be performed. Water is the vital mineral for a life. So, these data's can help us in predicting Rainfall during summer days to save water. Agriculture definitely requires gallons of waters. India is an agricultural country and secondary agro based market will be steady with a good monsoon. The economic growth of each year depends on the amount of duration of monsoon rain, bad monsoon can lead to destruction of some crops, which may result in scarcity of

some agricultural products which in turn can cause food inflation, insecurity and public unrest. In our analysis we are trying to understand the behavior of rainfall in India over the years, by months and different subdivisions.

LANGUAGES USED:

Python = 100% (Jupyter notebook)

APPROACHES:

PROJECT TITLE	*AUTHOR*	*OBJECTIVE/OUTCOME*
Spatial analysis of Indian Summer monsoon Rainfall (Mar 26,2014)	Makrand Oza C.M.Kishtawal	Understanding the variability in rainfall, analysis of Indian Summer monsoon rainfall using Spatial resolution.
Exploratory data Analysis of Indian Rainfall Data	Anusha Gajinkar	This Study shows that, India has two monsoon rainfall season one is northwest monsoon and second one is southeast monsoon.
Hybrid Prediction Models for Rainfall Forecasting	Singh, Gurpreet; Kumar, Deepak (2019). [IEEE 2019 9th International Conference on Cloud Computing, Data Science & Engineering	In this study, several hybrid forecasting models are proposed that are combinations two feature selection techniques, Gradient boosting and Random Forest with various machine learning techniques, viz Support Vector Machine (SVM), ad boost, Neural Network (NN) and K-Nearest Neighbour (KNN). These models have been applied to the past 11 years (2007 2017) weather data to predict rainfall in town of carry, North Carolina. The performances of these algorithms have been computed on different metrics F-score, precision, recall, accuracy. Empirical

		findings have shown that the proposed model i.e GB-Adaboost is superior when compared with others without feature selection.
Climate impacts on Indian Agriculture. (16 June,2004)	K.Krishna kumar K.Rupa Kumar R.G.Ashrit N.R.Deshpande J.W.Hansen	Presents about the analysis of Crop-climate relationships for India, using historical predictions.
A Data-Driven Approach for Accurate Rainfall Prediction	Manandhar, Shilpa; Dev, Soumyabrata; Lee, Yee Hui; Meng, Yu Song; Winkler, Stefan (2019). IEEE Transactions on Geoscience and Remote Sensing	In the paper, different ground-based weather features that are important for the prediction of rain events have been identified and a detailed analysis is done to study the interdependence of these variables.

CONCLUSION:

Weather conditions changes then and often. This can lead to Severe threats to all the living beings including human beings. So, predicting weather, especially Irregular heavy rainfall can cause huge floods and economic losses. This also decreases crop productivity and may lead into Food shortage. Predicting the Rainfall plays a vital role in our lifetime.

Unscrupulous industrial emissions andpollutants have altered the energy balance of atmosphere and made the Earth warmer. In the process of gradual warming, the mean of the temperature parameters across the globe have shifted upward at a particular point of time which amounts to climate change.

Such a phenomenal global warming has already affected various terrestrial and marine ecosystems especially rainfall which is one of the major determinants of food production. As observed by the IPCC and various other studies, the temperature trend, climate change and its impact on rainfall pattern have shown high geographical incoherence.