

Precision Farming for improving yield background:

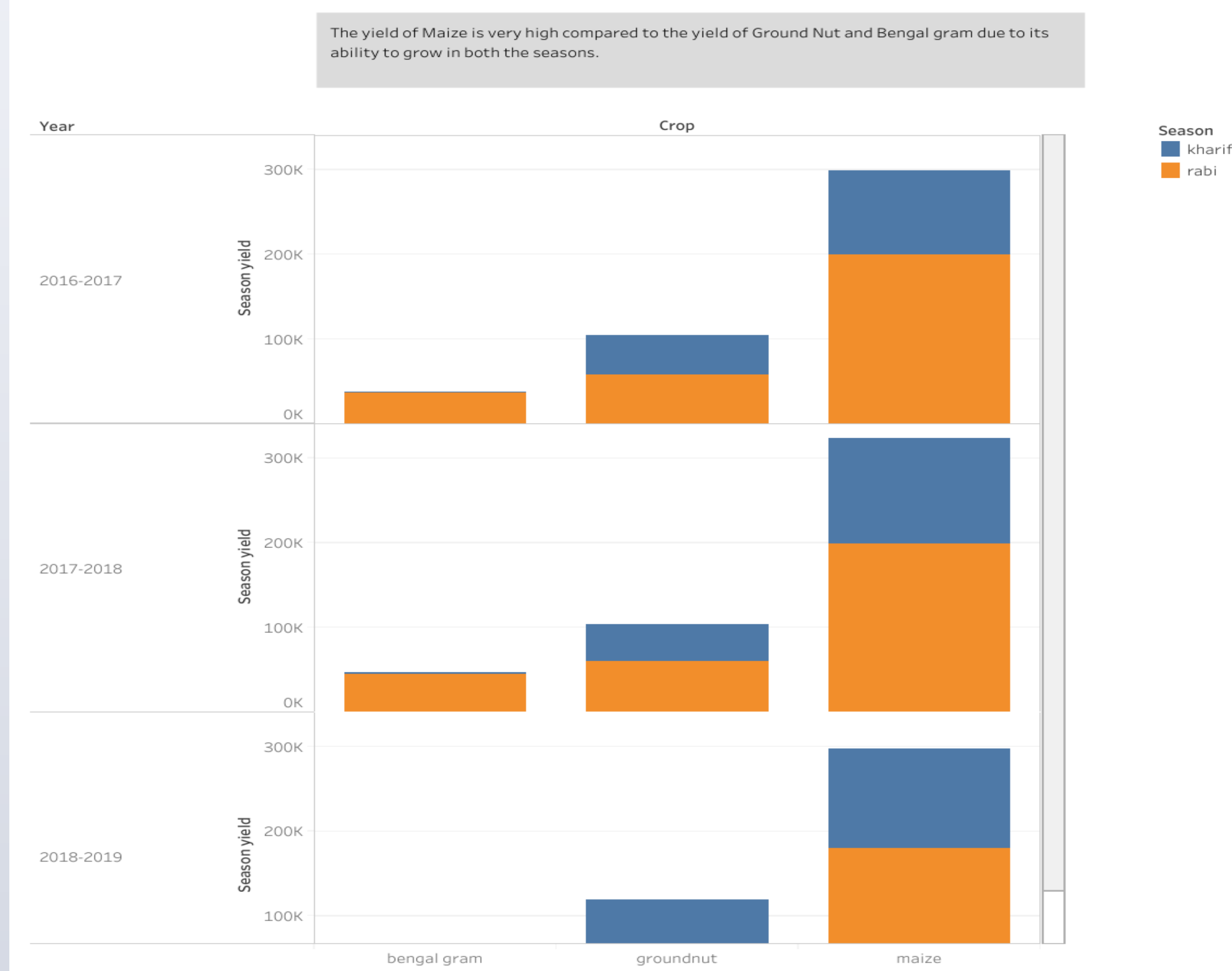
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TSiC- Data for Social Good Hackathon

Introduction

Farming is considered as major source of lively hood in many parts of Telangana. As we know the yield of crops depends on many aspects like land quality, type of crop used, rainfall, humidity, Crop season, wind conditions etc. The yield for the crop is variable due to the change in various parameters. So, from observing the coherency between the parameters and yield we created a Machine Learning based model which predict the yield of the particular crop based on the conditions prevailing in that area. Using these variables, predicting the historical yield through an ML model could give us statistical relationships between variables that affect the yield of a particular crop. We achieved an accuracy of 83.3% on our model.

Yield across the years 2016 - 2019



Methods

Design

Using Pre-Processing techniques on the given datasets to provide a efficient dataset for modeling the data.

Tools

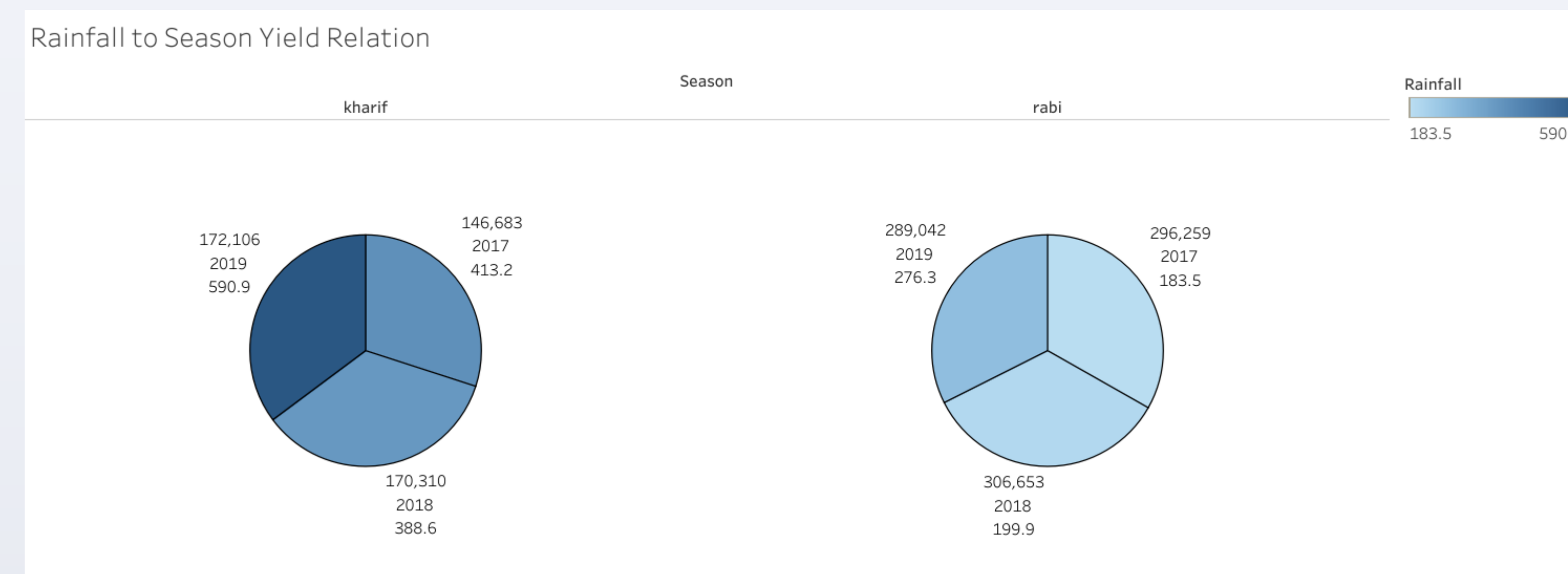
Tableau, Sci-kit Learn Toolkit.

Treatment

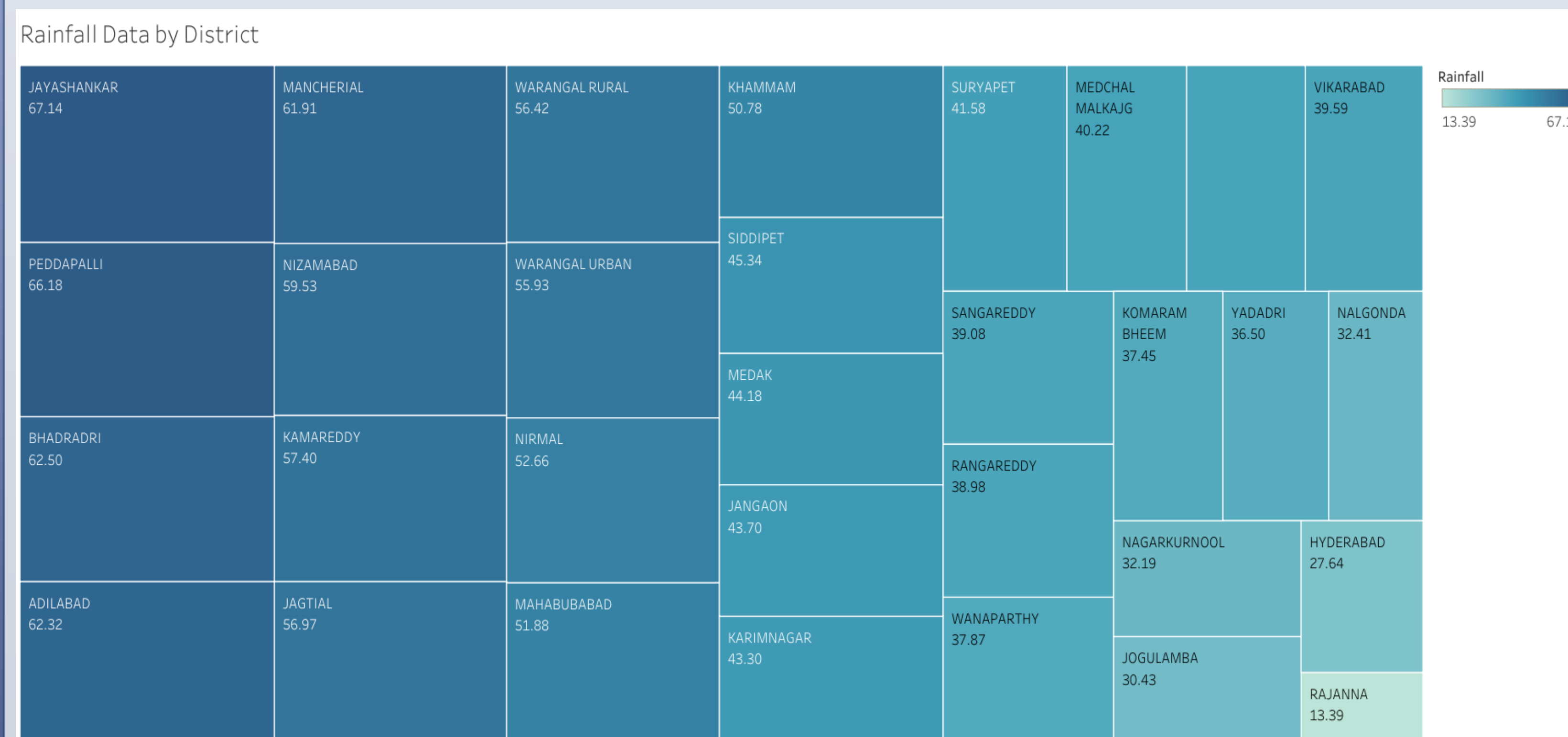
Based on the data from both the datasets, we eliminated the repeated columns and encoded our data for faster and accurate model, from the weather dataset we eliminated the districts and replaced the year column to match with the yield data's year column. At last merging the datasets into one created our desired dataset.

As part of model building, choosing a good model is important so we went with a linear regressor for better and accurate yield prediction. To verify the precision and accuracy of our model, we calculated the R squared error and found the value to be 0.83311.

Results

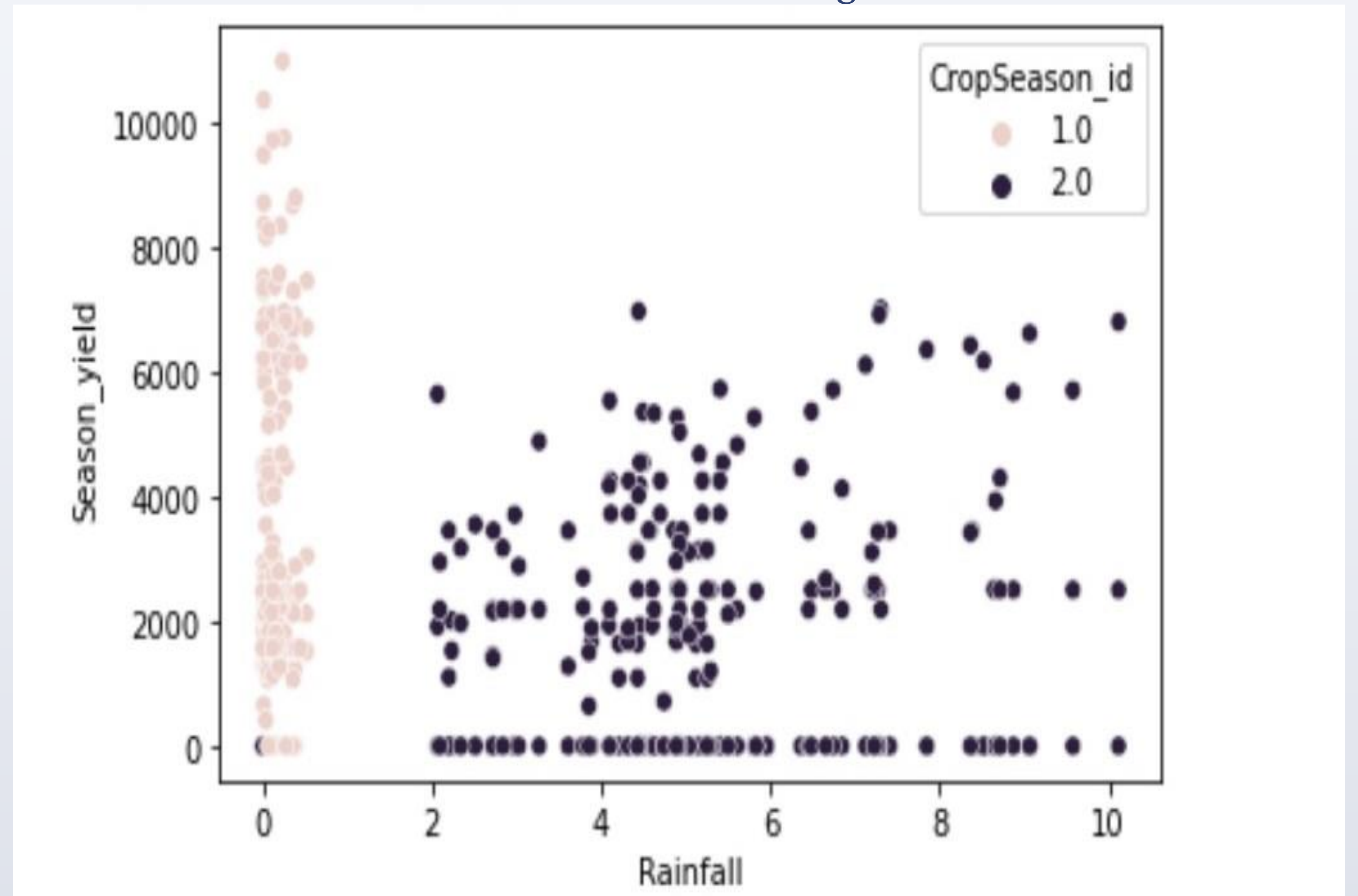


As we could see the crop yield is high in rabi season compared to kharif season, due the nature of crop. Farmers should grow various kharif crops in kharif season to produce more income out of land. And as year progress we could see the irregulaties in crop yield due to change in unpredictable weather changes.



Conclusions

From the datasets the important parameters that effect crop yield are Humidity, Temperature, Wind, Location of the land i.e District, we were able to mean the data from their min and max values. After the average values are known the data is sent for modeling.



Many crops aren't sown in kharif season leading to many 0 yield values in the data even though having enough rainfall. So, crops must be sown based on season or rainfall. With the help of machine learning we could take the necessary measures like increasing the fertilizer quantity etc. But for max yield of crop the optimum conditions are having low rainfall.