

# RAIN FALL PREDICTION-INDIA

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CAPSTONE PROJECT

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Collect Historical  
districtwide Rainfall  
data



Analyze the data to  
find insights and  
correlation



Model Selection



Train Model



Validation

# OBJECTIVE

# PURPOSE



Prediction of rainfall can be beneficial for many sectors like Agriculture- Crop selection, Government - Disaster Management, Food Security.

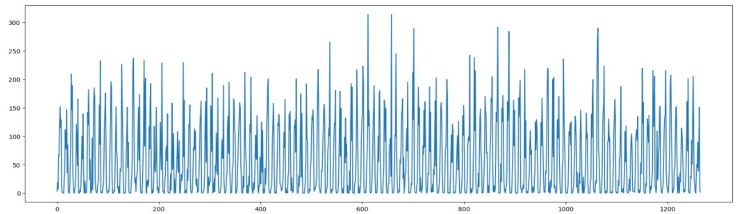
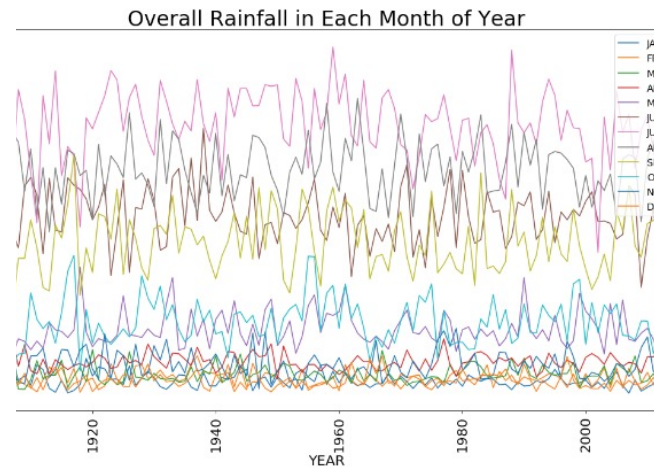
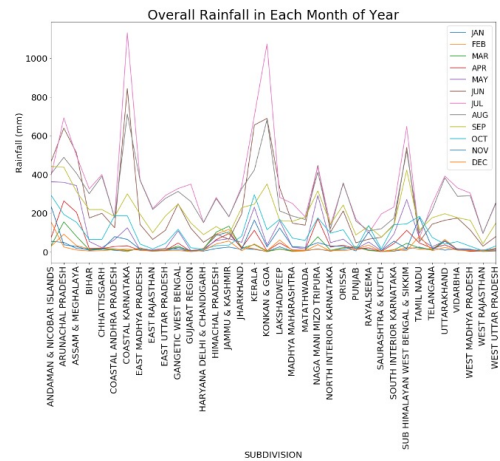


It is possible to achieve with the help of AI and historical data

- Historical Rainfall data is Time Series, Rainfall prediction can be done with more accuracy by RNN models
- Selected LSTM and GRU Models
- Train both models with data and compare the accuracy.

## APPROACH

# EDA

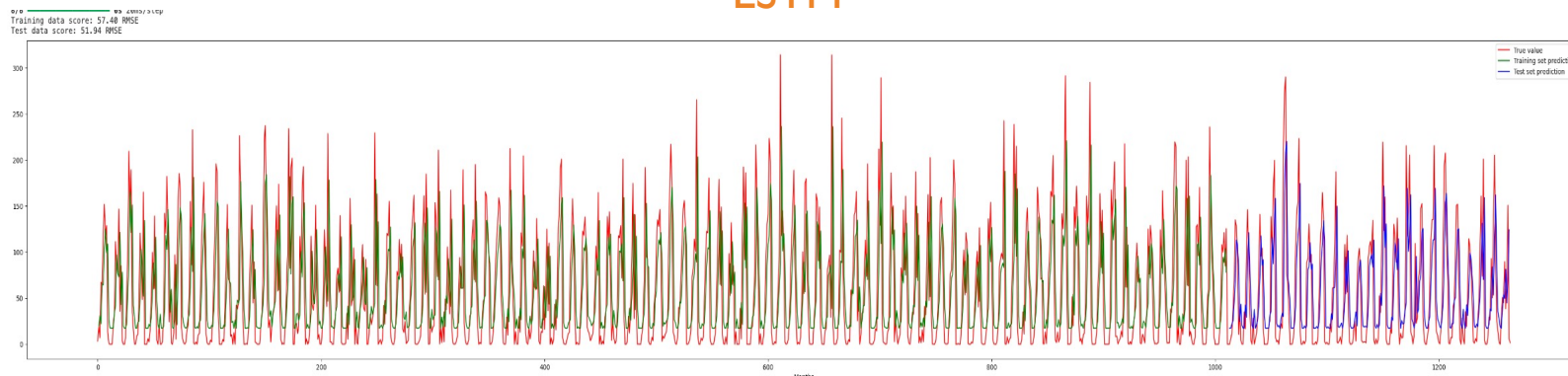


# MODEL SUMMARY

- **LSTM:**
  - LSTM has three gates: **input gate**, **output gate**, and **forget gate**.
  - These gates control the flow of information within the network.
  - LSTM includes a memory cell (cell state) that allows it to capture long-term dependencies.
- **GRU:**
  - GRU has two gates: **reset gate** and **update gate**.
  - It simplifies the architecture by combining the input and forget gates into a single update gate.
  - GRU does not have a separate memory cell like LSTM.

Code: <https://github.com/psterdale/dsaiml-capstone>

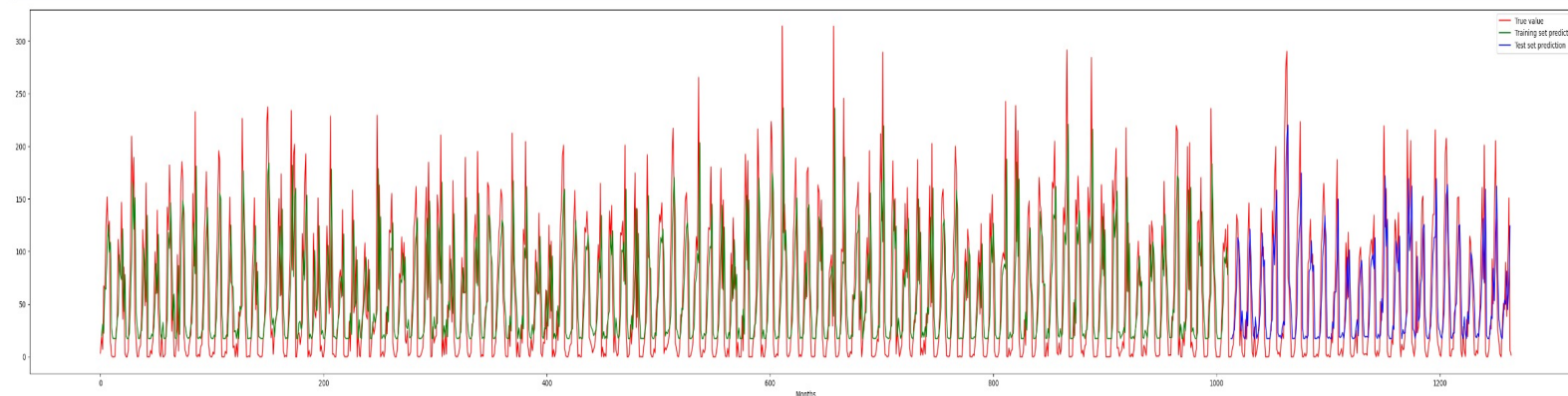
## LSTM



Training data score: 57.40 RMSE  
Test data score: 51.94 RMSE

Time- 250ms/Step

## GRU



Train Score: RMSE: 0.16  
Validation Score: RMSE: 0.16  
Test Score: RMSE: 0.15

Time- 15ms/Step

# RESULT



# INFERENCE

- GRU is faster than LSTM, LSTM takes more time with same accuracy for given data

- Dataset:

<https://www.kaggle.com/datasets/rajanand/rainfall-in-india>

- Kaggle Notebook-

<https://www.kaggle.com/code/parisaterdale/rainfall-prediction-india/>

- Blogs

<https://machinelearningmastery.com/how-to-develop-lstm-models-for-time-series-forecasting/>

- <https://towardsdatascience.com/illustrated-guide-to-lstms-and-gru-s-a-step-by-step-explanation-44e9eb85bf21>

## REFERENCES