Project Design Phase-I
Solution Architecture

Date	20 November 2023
Team ID	591569
Project Name	Machine Learning Approach for Predicting the Rainfall
Maximum Marks	4 Marks

Solution Architecture:

This solution architecture ensures a comprehensive approach to rainfall prediction, integrating machine learning techniques with real-time capabilities, scalability, and user-friendly interfaces for practical application in various domains.

1). Data Collection:

- Gather historical rainfall data across India from various sources, including meteorological stations and satellites.

2). Feature Engineering:

- Extract relevant features such as temperature, humidity, wind speed, and geographical factors.
- Create additional features to capture seasonal and regional patterns.

3). Training Data Split:

- Divide the dataset into training and validation sets, ensuring temporal continuity.

4). Model Selection:

- Choose appropriate machine learning algorithms (e.g., Random Forest, LSTM) for rainfall prediction.
- Train the model on the training dataset, optimizing hyperparameters.

5). Performance Evaluation:

- Validate the model on the test dataset, using metrics like Mean Absolute Error (MAE) and Root Mean Square Error (RMSE).
- Iteratively refine the model based on performance feedback.

6). Forecasting:

- Utilize the trained model to forecast rainfall patterns for future time periods.
- Implement a mechanism to update the model regularly with new data.

Solution Architecture Diagram:
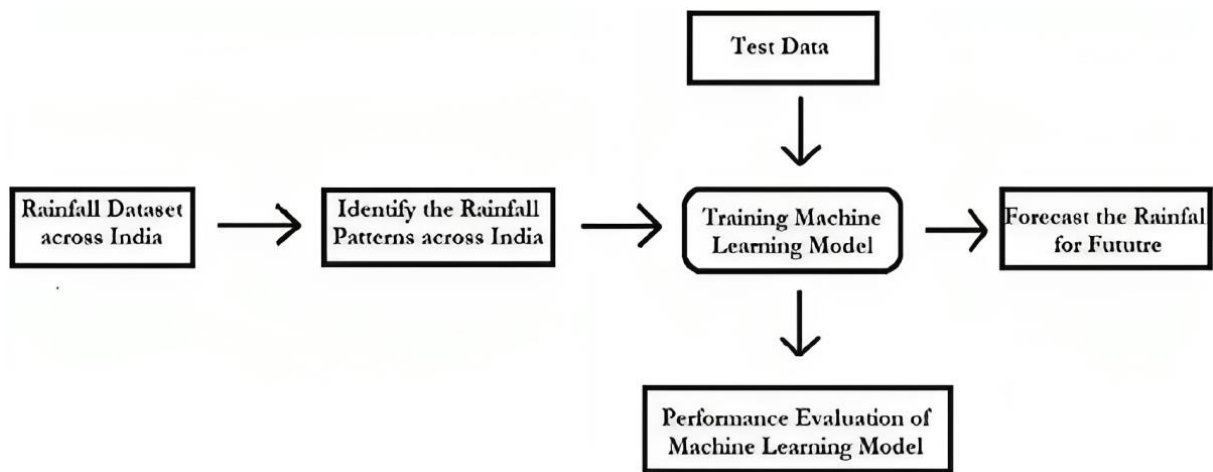
Architecture and data flow of the Machine Learning Approach for Predicting Rainfall

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