Project Design Phase-II
Technology Stack (Architecture & Stack)

Date	17 November 2023
Team ID	Team-591644
Project Name	Machine Learning Approach For Predicting The Rainfall
Maximum Marks	4 Marks

Technical Architecture:

The Deliverable shall include the architectural diagram as below and the information as per the table1 & table 2

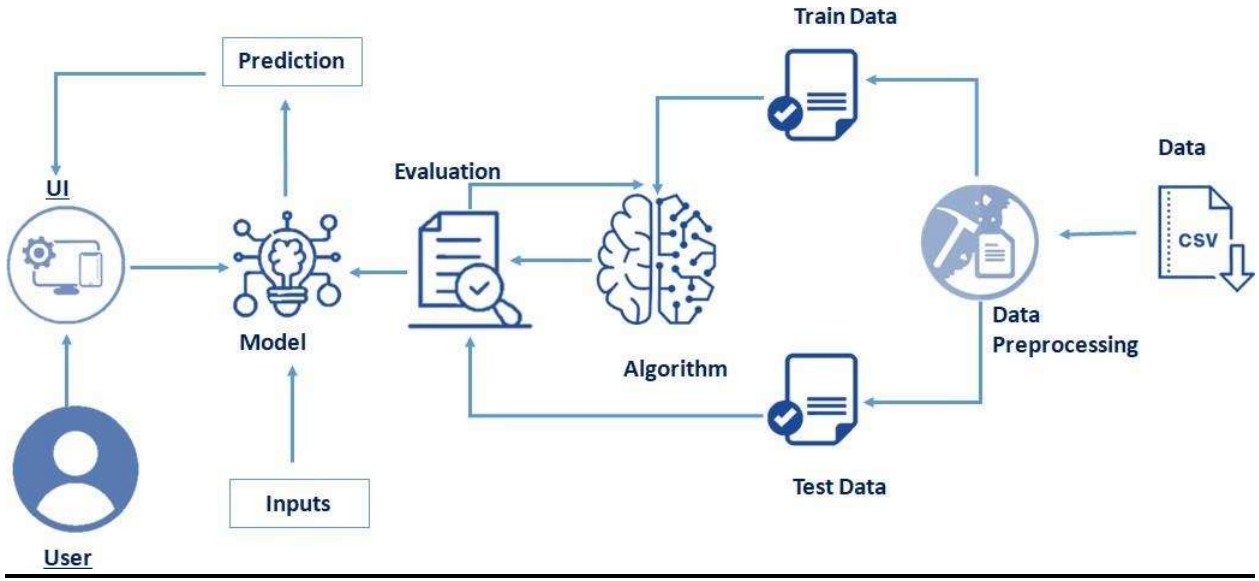

Table-1: Components & Technologies:

S.No	Component	Description	Technology
1	Data Sources	Meteorological data repositories	Weather Stations, Satellite Data, Meteorological Databases
2	Data Collection & Preprocessing	Gathering and cleaning historical weather data	Python (Pandas, NumPy), SQL, Data Cleaning Libraries
3	Feature Engineering	Identifying and extracting relevant predictors	Feature Selection Algorithms, Dimensionality Reduction Techniques
4	Machine Learning Model	Algorithms for rainfall prediction	Random Forest, Gradient Boosting, Recurrent Neural Networks (RNN), Long Short-Term Memory (LSTM)
5	Model Training & Evaluation	Training and assessing model accuracy	Scikit-learn, TensorFlow, Keras
6	Deployed Model	Real-time prediction system	Cloud-based Services, API Integration
7	User Interface	Interface for user interaction and visualization	Web/Mobile Application, Data Visualization Libraries
8	Scalable Infrastructure	Resources for handling increased computational demands	Cloud Platforms (AWS, Azure, Google Cloud), Distributed Computing
9	Feedback Loop	Mechanism for model updates and improvement	Automated Model Updating, Continuous Monitoring

Table-2: Application Characteristics:

S.No	Characteristics	Description	Technology
1	Accuracy	Precision of rainfall forecasts	Machine Learning Algorithms, Evaluation Metrics (MAE, RMSE)
2	Accessibility	User interface and ease of access	Web/Mobile Application, API Integration
3	Real-time Prediction	Timeliness of forecast updates	Cloud-based Services, Real-time Data Processing
4	Scalability	Ability to handle increased data and computation	
5	Reliability	Consistency and trustworthiness of predictions	Model Validation, Continuous Monitoring
6	Adaptability	Ability to accommodate changing weather patterns	Dynamic Feature Engineering, Model Retraining
7	User-Friendly	Intuitive interface for diverse user groups	UI/UX Design, User Testing
8	Performance	System efficiency and speed	Optimized Algorithms, Parallel Processing
9	Maintenance	Ease of system upkeep and updates	Automated Model Updating, Version Control