Date	12 June 2025
Team ID	LTVIP2025TMIDS67798
Project Name	RAINFALL PREDICTION USING MACHINE LEARNING
Maximum Marks	3 Marks

Project Proposal: Rainfall Prediction Using Machine Learning

Project Title

Rainfall Prediction Using Machine Learning O Introduction

Accurate rainfall prediction is crucial for sectors like agriculture, water resource management, and disaster preparedness. Your project leverages machine learning techniques to forecast rainfall based on historical weather data.

O Problem Statement

Traditional methods of rainfall prediction often lack the accuracy and adaptability required for effective decision-making. This project aims to develop a machine learning model that can provide more reliable and timely rainfall forecasts.

⭕ Objectives

Primary Objective: Develop a machine learning model to predict rainfall.

Secondary Objectives:

- o Collect and preprocess historical weather data.

- o Implement and evaluate various machine learning algorithms. o Optimize the model for accuracy and efficiency.

- o Deploy the model for practical use.

⭕ Scope

The project will focus on predicting rainfall based on historical weather data, excluding real-time data collection or integration with external APIs.

⭕ Methodology

- o **Data Collection:** Gather historical weather data, including temperature, humidity, wind speed, and pressure.
- o **Data Preprocessing:** Clean and prepare the data for analysis.
- o **Model Development:** Implement machine learning algorithms such as Linear Regression, Decision Trees, and Random Forest.
- o **Model Evaluation:** Assess the model's performance using metrics like accuracy,precision, and recall.
- o **Deployment:** Develop a user interface for model interaction and prediction.

⭕ Technology Stack

Programming Language: Python

Libraries: Pandas, NumPy, Scikit-learn, Matplotlib

Tools: Jupyter Notebook, GitHub

⭕ Expected Outcomes

Accurate Rainfall Predictions: A model that can reliably forecast rainfall.

User Interface: An interface that allows users to input data and receive predictions.

Documentation: Comprehensive documentation for users and developers.

⭕ Timeline

Phase	Duration	Deliverables
Data Collection	2 weeks	Dataset ready for analysis

Data Preprocessing	1	week	Cleaned and prepared dataset
Model Development	3	weeks	Trained machine learning models
Model Evaluation	1	week	Performance metrics and analysis
Deployment	2	weeks	Functional user interface
	1	week	Final report and user manual
Documentation ⭘			

Budget Estimate

Item	Estimated Cost
Data Acquisition	₹5,000
Software Tools	₹3,000
Cloud Services	₹2,000
Miscellaneous	₹1,000
Total	**₹11,000**

⭘ Conclusion

This project aims to enhance the accuracy and reliability of rainfall predictions, providing valuable insights for various sectors. By leveraging machine learning, the model can adapt to changing weather patterns and improve decision-making processes.