Project Initialization and Planning Phase

Date	18 June 2025
Team ID	SWTID1749705847
Project Title	Rising Waters: A Machine Learning Approach to Flood Prediction
Maximum Marks	3 Marks

Project Overview	
Objective	To develop a machine learning model that accurately predicts flood occurrences by analyzing meteorological and environmental data. The goal is to provide early warnings and support disaster preparedness to minimize flood impact.
Scope	This project aims to apply machine learning techniques on historical weather and river data to predict floods with high accuracy. The system can assist authorities in issuing early warnings, planning disaster response, and enhancing infrastructure resilience in flood-prone regions.
Problem Statement	
Description	This project focuses on predicting flood occurrences using machine learning by analyzing factors such as rainfall, temperature, humidity, cloud cover, and seasonal rainfall patterns. By training models on historical environmental data, the system aims to provide accurate flood predictions, enabling early warnings, better disaster management, and reduced impact on lives and infrastructure.
Impact	The flood prediction model provides timely and accurate alerts, helping save lives, protect property, and support efficient disaster response. It empowers authorities and communities to take proactive measures, reducing the overall damage caused by flood events.
Proposed Solution	
Approach	We collected and preprocessed historical meteorological and flood data, performing univariate, bivariate, and multivariate analysis to understand patterns and relationships. Outliers were removed, and features were standardized before training machine learning models to predict flood occurrences, followed by evaluation using metrics like accuracy, precision, and recall.
Key Features	The model predicts floods using machine learning by analyzing historical rainfall, temperature, humidity, and other environmental data. It enables early warnings and supports effective disaster preparedness and response.

Project Proposal (Proposed Solution) report

The proposal aims to transform flood prediction using machine learning, improving the accuracy and timeliness of flood risk assessments. It addresses current gaps in early warning systems, promising better disaster preparedness, minimized damage, and improved community safety. Key features include a machine learning-based flood prediction model, real-time alerts, and data-driven support for disaster response planning.

	• Real-time flood risk assessment for quicker disaster response and warnings. • Continuous learning to adapt to changing climate patterns and flood behaviors

Resource Requirements

Resource Type	**Description**	**Specification/Allocation**
Hardware		
Computing Resources	CPU/GPU specifications, number of cores	T4 GPU
Memory	RAM specifications	8 GB
Storage	Disk space for data, models, and logs	1 TB SSD
Software		
Frameworks	Python frameworks	Flask
Libraries	Additional libraries	scikit-learn, pandas, numpy, matplotlib, seaborn
Development Environment	IDE	Jupyter Notebook, pycharm
Data		
Data	Source, size, format	Kaggle dataset-csv