Technology Stack [Architecture & Stack]

Date	03 February 2026
Team ID	LTVIP2026TMIDS74755
Project Name	Rising Waters: A Machine Learning Approach To Flood Prediction
Maximum Marks	4 Marks

Technical Architecture:

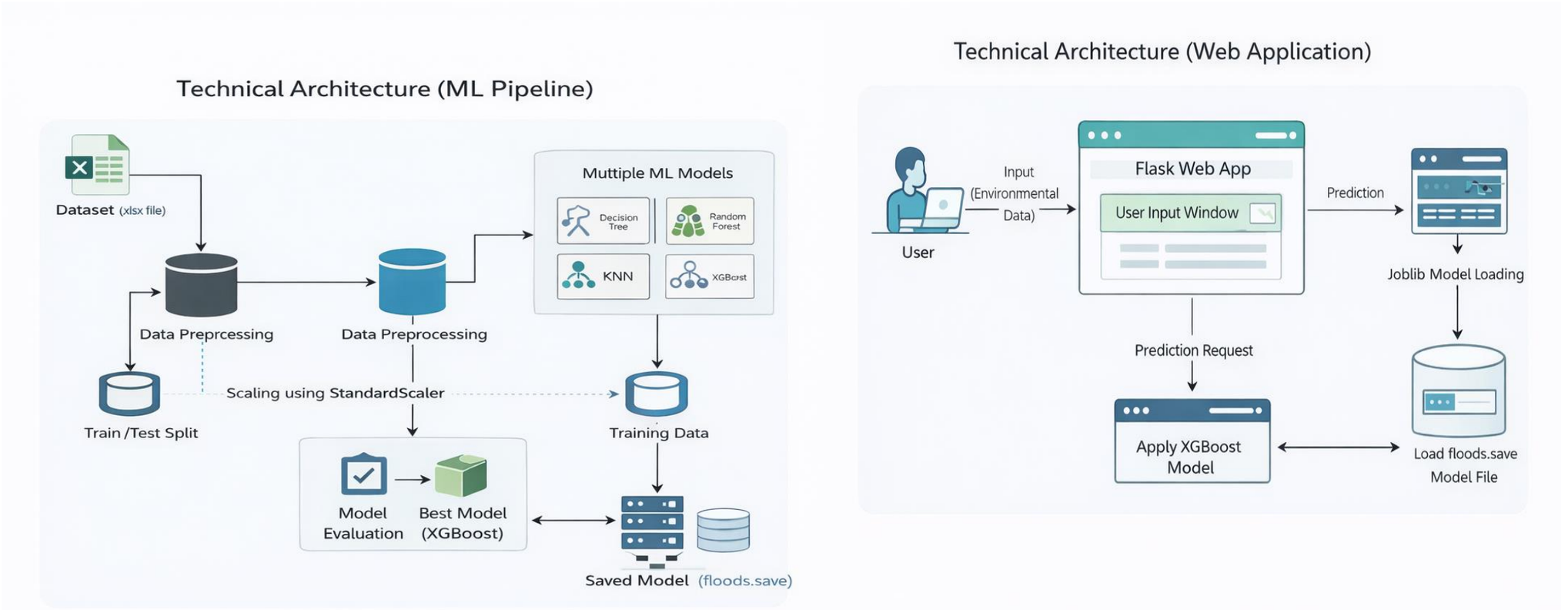

Table-1: Components & Technologies

S.No	Component	Description	Technology
1.	User Interface	Web interface through which users enter environmental parameters and view prediction results	HTML, CSS
2.	Dataset	Historical environmental data used for training and testing the model	Excel (.xlsx file)
3.	Backend Framework	Handles user requests and connects UI with ML model	Python Flask
4.	API	Used to process the input data and return prediction results	Flask Routing
5.	Application Logics	Implements preprocessing, model loading, and prediction logic	Python
6.	Machine Learning Model	Classification model developed to predict flood occurrence	Scikit-learn, XGBoost
7.	Data Pre-processing and Analysis	Data cleaning, scaling, visualization, and feature selection	NumPy, Pandas, Matplotlib, Seaborn, StandardScaler

Table-2: Application Characteristics

S.No	Characteristics	Description	Technology
1.	Open-Source Frameworks	Backend framework and ML libraries used in development	Python Flask / NodeJS, MongoDB, IBM DB2, CSS-3
2.	Security Implementations	Input validation and controlled access to prediction functionality	SSL Certs, Direct verification using Backend Framework
3.	Scalable Architecture	Additional features or larger datasets can be integrated easily.	IBM Cloud Kubernetes Service
4.	Availability	Web application can be deployed and accessed through hosting platforms	Heroku cloud hosting (for testing) , IBM cloud hosting
5.	Performance	The system generates predictions quickly with trained and saved model	Load Balancers and Distributed servers