

Project Design Phase Solution Architecture

Date	04 February 2026
Team ID	LTVIP2026TMIDS56565
Project Name	Rising Waters: A Machine Learning Approach to Flood Prediction
Maximum Marks	4 Marks

Solution Architecture:

Solution architecture is a complex process – with many sub-processes – that bridges the gap between business problems and technology solutions. Its goals are to:

- **Structural Components:** The system is built on a **3-tier architecture**:
 - **Presentation Layer:** HTML5/Bootstrap 5 interface for user inputs.
 - **Logic Layer:** Flask server (`app.py`) managing data flow and preprocessing.
 - **Data/Model Layer:** Joblib-serialized Random Forest model and CSV dataset.
- **Behavior:** When a user inputs environmental data, the system performs **Label Encoding** and **Feature Scaling** before passing a 13-feature vector to the model for real-time classification.
- **Specifications:** The solution is delivered as a local web application running on port **5000**, requiring Python packages like `scikit-learn` and `Flask`.

Example - Solution Architecture Diagram:

