

Low-Level Design (LLD) Document

1. Introduction

The Low-Level Design (LLD) document provides a detailed breakdown of each module in the Mushroom Classification project.

2. Modules Breakdown

1. **Data Preprocessing**: Handles data cleaning, missing values, and encoding categorical variables.
2. **Model Training**: Trains multiple models (Logistic Regression, Decision Tree, Random Forest) and selects the best.
3. **Flask API**: Serves predictions via an HTTP endpoint.
4. **User Interface**: Provides a dropdown for user interaction and fetches predictions from the API.
5. **Logging & Error Handling**: Logs API requests, errors, and model predictions.

3. API Endpoints

- **POST /predict**: Receives a JSON request with mushroom details and returns the prediction.
- **GET /**: Renders the user interface with a dropdown to select mushrooms.

4. Database Schema (if applicable)

The project does not require a database, as it loads data from a CSV file and makes real-time predictions.

5. System Flow

1. User selects a mushroom from the dropdown.
2. JavaScript sends a request to the Flask API.
3. The API preprocesses the input and makes a prediction.
4. The response is sent back to the user interface and displayed on the screen.

6. Future Enhancements

- Improve UI with visualization.
- Store past predictions in a database for tracking.
- Deploy API on cloud services like AWS or GCP.