

Smart Irrigation Advisor

Week 1 Report – Dataset Preparation & System Design

Author: Komal Singh

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Abstract

This project focuses on developing a Smart Irrigation Advisor system to promote sustainable agriculture. In Week 1, the dataset was prepared and the system design was conceptualized. The dataset simulates real farm conditions with soil moisture, rainfall, temperature, and crop type. A simple rule-based model determines irrigation requirements based on these parameters. This foundational dataset and design will be used for further development in subsequent weeks.

Objectives

- Prepare a dataset for Smart Irrigation Advisor.
- Define rules for irrigation requirements.
- Create initial system design and flowchart.
- Document methodology for further development.

Dataset Preparation

A dataset was prepared with 20 records representing daily agricultural observations. The attributes include soil moisture, rainfall, temperature, crop type, and irrigation requirement. The decision rule applied is: If Soil Moisture < 30% and Rainfall < 5mm, irrigation is required; otherwise, no irrigation is needed.

System Design

The Smart Irrigation Advisor system consists of three main components:

1. Input Layer – Collects data on soil moisture, rainfall, temperature, and crop type.
2. Decision Layer – Applies rule-based logic to determine irrigation requirements.
3. Output Layer – Provides recommendations for irrigation (Yes/No).

Flowchart: Start → Collect Data → Check Soil Moisture (<30%) → If No, No Irrigation → If Yes, Check Rainfall (>5mm) → If Yes, No Irrigation → If No, Irrigation Required.

Conclusion & Next Steps

In Week 1, a realistic dataset and initial system design were created. This forms the foundation for implementing a prototype in Week 2, where the dataset will be processed using Python to provide irrigation predictions. In Week 3, the system will be enhanced with additional features and potentially machine learning models.