

Week 2 Report – Smart Irrigation Advisor for Sustainable Agriculture

Abstract

This report describes the development of a prototype software system that predicts irrigation requirements using soil moisture, rainfall, and temperature data. The system builds on the Week 1 dataset and applies rule-based logic to determine whether irrigation is required, thereby supporting sustainable agriculture practices.

Objectives

1. Develop a Python prototype that processes agricultural datasets.
2. Implement rule-based decision-making for irrigation prediction.
3. Generate visualizations for interpreting data trends.
4. Save and evaluate prediction results.

Methodology

The system uses the Week 1 dataset as input. For each day, the following rule was applied:

- If Soil Moisture < 30% and Rainfall < 5mm → Irrigation Required = Yes
- Else → Irrigation Required = No

The prototype was implemented in Python using pandas for data processing and matplotlib for visualization.

Results

The predictions generated by the prototype matched the Week 1 dataset perfectly, achieving 100% accuracy. A scatter plot visualization was also created to display the relationship between soil moisture, temperature, and irrigation requirement.

Conclusion

The Week 2 prototype successfully demonstrated automated irrigation prediction using simple rules. This provides the foundation for more advanced approaches, such as machine learning, to be developed in Week 3.