**Project title**: Farm yangu

**Introduction**

Farm yangu focuses on developing an innovative irrigation system designed to assist farmers in specific geographical locations in effectively managing water usage and monitoring soil nutrient levels. By integrating weather APIs relevant to the region, the system helps determine the optimal times for watering based on local rainfall predictions, ensuring efficient resource use. The system communicates directly with the farmer, providing updates on how much water has been used and which week the crops are in their growth cycle. It is tailored to support three key crops: coffee, maize, and skuma wiki, offering detailed data on their water and nutritional requirements throughout the growing season. By leveraging these insights, farmers can optimize crop yields, reduce wastage, and enhance sustainable agricultural practices based on their unique environmental conditions.

**Objectives**

* To develop an irrigation system that assists farmers in monitoring and managing water usage and soil nutrient levels.
* To design a system that communicates directly with farmers, providing detailed updates on water usage and the crop growth cycle.
* To create a data-driven platform that offers weekly insights into the water and nutritional requirements for three key crops: coffee, maize, and sukuma wiki.
* To incorporate geographical location data into the system, ensuring that weather forecasts and agricultural insights are tailored to the specific environmental conditions of the region.
* To promote sustainable farming practices by helping farmers optimize water and nutrient use, reduce wastage, and improve crop yields.
* To integrate weather APIs into the system to autonomously determine whether irrigation is necessary based on rainfall predictions, ensuring the system controls the irrigation process without requiring the farmer to make decisions.

**Scope**

The project is an IoT-based smart irrigation system for technology-driven crop farming and will have a well-defined scope, outlining its key focus areas and specifying its limitations. The project will concentrate on the irrigation requirements of three specific crops: maize, coffee, and sukuma wiki. The primary goal will be the development and implementation of an IoT-based smart irrigation system, incorporating soil moisture sensors, data collection, and real-time analysis of soil moisture and weather conditions (such as temperature, rainfall, humidity, and wind speed).

The system will integrate weather APIs to autonomously determine whether to irrigate based on local rainfall predictions, eliminating the need for farmers to make manual decisions. It will be tailored to meet the unique water and nutritional requirements of maize, coffee, and skuma wiki throughout their different growth stages. Additionally, the project will focus on optimizing water usage through real-time monitoring and automatic adjustments based on soil moisture and weather data specific to various geographical regions in Kenya. The system will primarily target small-scale farmers, promoting sustainable water usage and improving crop yields.

**Methodology**

*Database Integration*

* The system will use a database to store data on water usage, soil moisture, crop growth, and weather forecasts.

*Microcontroller*

* The microcontroller will manage sensors, solenoid valves, and weather API data, automating the irrigation process.

*Mobile Application*

* The mobile app provides an interface for farmers to monitor water usage, crop stages, and receive notifications.