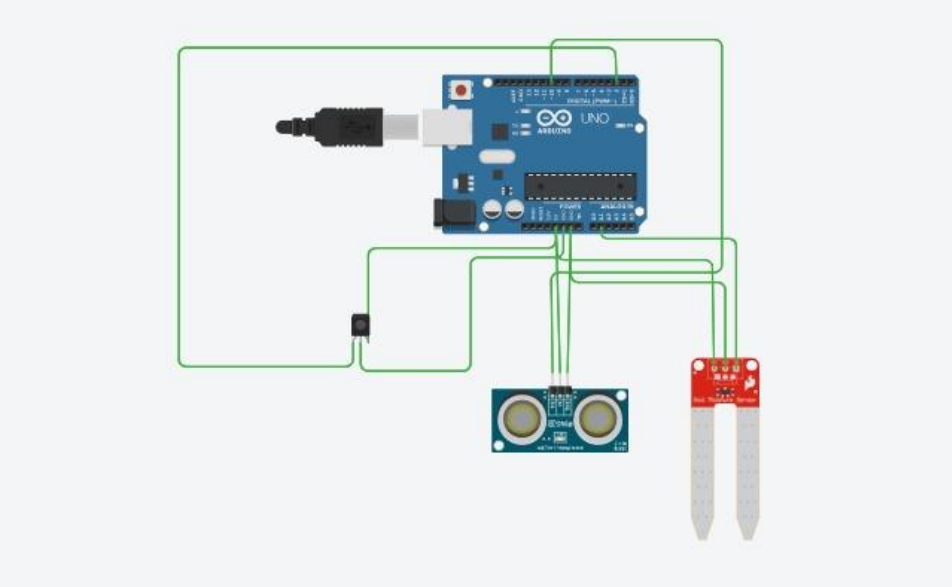

Arduino Smart Monitoring System – Tinkercad Project

This document presents the design and simulation of an Arduino-based smart monitoring system developed using Tinkercad. The project integrates a soil moisture sensor and an ultrasonic sensor to monitor environmental conditions, making it suitable for smart agriculture and automation applications.

Project Overview

The main objective of this project is to sense soil moisture levels and measure distance using an ultrasonic sensor. The Arduino UNO acts as the central controller, reading sensor values and processing the data for further decision-making.

Components Used

- Arduino UNO

- Soil Moisture Sensor

- Ultrasonic Sensor (HC-SR04)

- Push Button

- Jumper Wires

- USB Power Supply

Circuit Description

The Arduino UNO is powered through a USB connection. The soil moisture sensor is connected to the analog input pins to measure moisture content in the soil. The ultrasonic sensor is connected to digital pins to measure distance using trigger and echo signals. A push button is included for manual input or system control.

Working Principle

When the simulation starts, the Arduino continuously reads data from the soil moisture sensor and ultrasonic sensor. The moisture sensor detects the water level in the soil, while the ultrasonic sensor measures distance based on sound wave reflection. These values can be displayed or used to trigger actions such as alerts or automation.

Applications

- Smart irrigation systems

- Agriculture monitoring

- Water level detection

- IoT-based environmental monitoring

Conclusion

This Tinkercad simulation demonstrates a simple yet effective Arduino-based monitoring system. It helps in understanding sensor integration, circuit design, and basic automation concepts, making it ideal for beginners and academic projects.