Auto Irrigation Project

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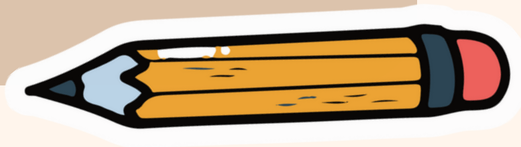
INTRODUCITON

Water is a precious resource, and efficient irrigation systems are crucial for conserving it while ensuring optimal plant growth.
This project aims to develop an Arduino-based auto irrigation system that can monitor soil moisture levels and control the irrigation of plants accordingly.
The system will provide an automated and efficient solution for managing water resources in small scale agriculture and gardening.



LIST OF COMPONENTS

1. Arduino Uno R3
2. Soil Moisture Sensor
3. DC Motor
4. Green LED
5. 330 Ω Resistor
6. Relay SPDT
7. 5 , 5 Power Supply

Component List

Name	Quantity	Component
UUno 1	1	Arduino Uno R3
SEN1	1	Soil Moisture Sensor
M1	1	DC Motor
D2	1	Green LED
R1	1	330 Ω Resistor
K2	1	Relay SPDT
P1	1	5 , 5 Power Supply

Component Description

Ardiuno Uno R3

The Arduino Uno R3 is a popular microcontroller board with features including a 16 MHz Atmega328P microcontroller, 14 digital I/O pins, 6 analog input pins, USB interface, 5V operating voltage, and compatibility with various shields and sensors. It's easy to program using the Arduino IDE, making it a versatile and widely used platform for electronics and embedded systems projects.

Soil Moisture Sensor

A soil moisture sensor in an embedded system measures soil moisture levels, usually via electrical conductivity, and provides data to an embedded controller (e.g., microcontroller). This data can be used for automated irrigation and environmental monitoring, helping to conserve water and optimize plant health. Calibration, power management, and environmental durability are important considerations when using these sensors.

Component Description

DC Motor

A DC (Direct Current) motor is an electrical machine that converts electrical energy into mechanical energy. It operates based on the principles of electromagnetism and is commonly used in a wide range of applications, including robotics, industrial machinery, automotive systems, and more

Resistor

A resistor is an essential electronic component that provides resistance to the flow of electrical current. It is widely used in electrical and electronic circuits to control current, voltage, and power levels.

Component Description

Relay SPDT

A SPDT (Single-Pole, Double-Throw) relay, also known as a changeover relay, is a type of electromagnetic switch used in various electrical and electronic applications. It has three terminals and can connect one common terminal to either of the other two, making it a versatile switching device.

Power Supply

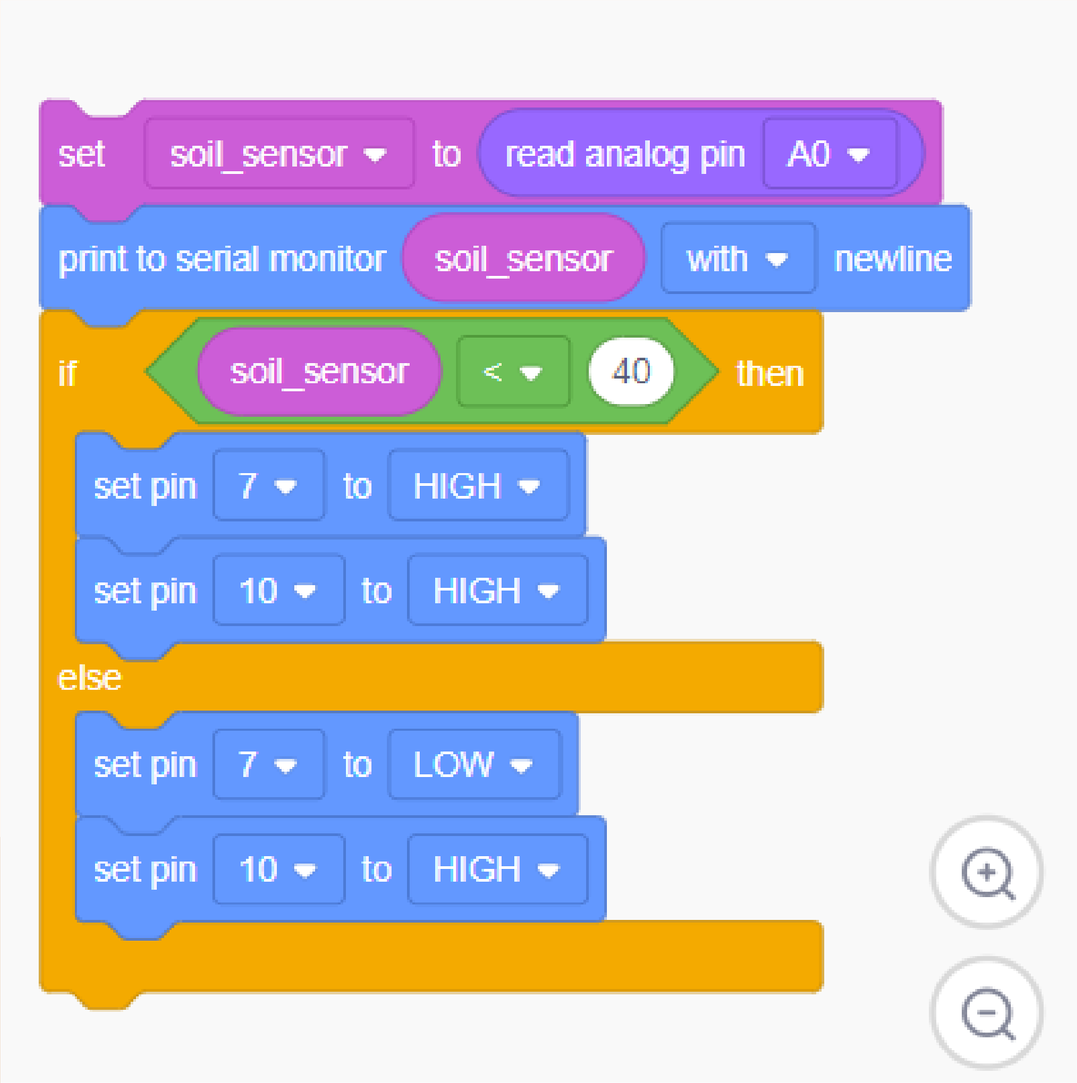
A power supply, in the context of electronics and electrical engineering, is a device or system that provides electrical energy to other devices or components. It is responsible for converting electrical energy from one form to another in a controlled and predictable manner

Working of Auto Irrigation Project

Working

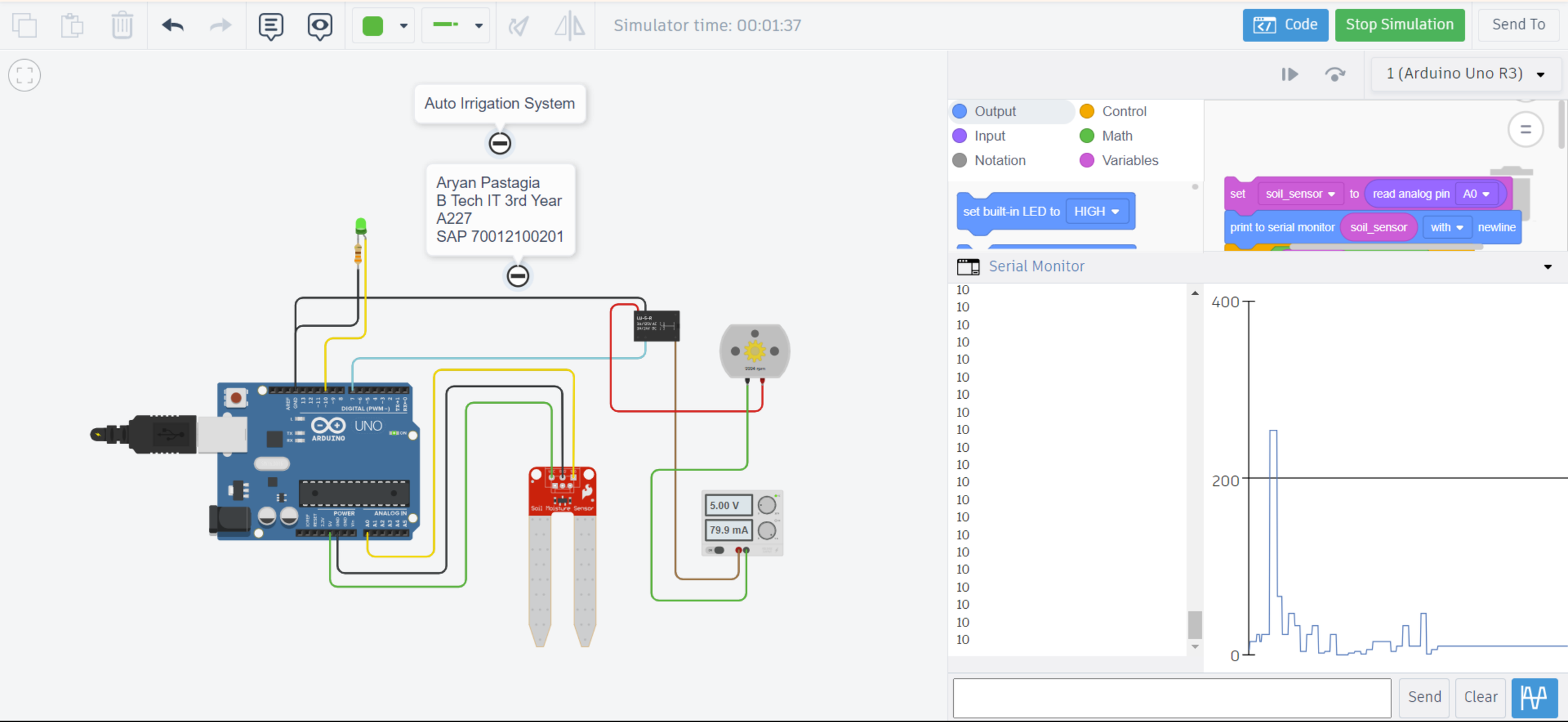
Arduino-based auto-irrigation project on Tinkercad uses a soil moisture sensor to measure soil moisture levels. If the moisture falls below a specified threshold, the Arduino activates a water pump to irrigate the plants. It continuously monitors and waters the plants automatically, ensuring they receive the right amount of moisture for healthy growth, all within the Tinkercad simulation environment.

Algorithm

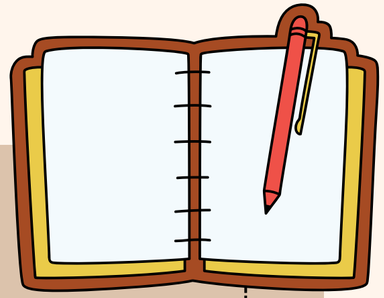

set soil_sensor to read analog pin A0
print to serial monitor soil_sensor with newline
if soil_sensor < 40 then
set pin 7 to HIGH
set pin 10 to HIGH
else
set pin 7 to LOW
set pin 10 to HIGH

Demonstration

https://www.tinkercad.com/things/6WCCOENzgMp-aryana227-es-project/editel



Conclusion



Arduino-based auto-irrigation project on Tinkercad demonstrates a simple yet effective solution for automating plant care. By integrating a soil moisture sensor and an Arduino controller, the system keeps a vigilant eye on the soil's moisture level. When the moisture falls below a predetermined threshold, it triggers a water pump to maintain optimal soil conditions for plant growth. This project exemplifies the power of technology in enhancing agriculture and serves as an excellent starting point for individuals interested in developing efficient and sustainable plant irrigation systems. Whether for small-scale gardening or larger agricultural applications, this system showcases the potential for automation and precision in nurturing our green companions.