APPLIED PHYSICS LAB PROJECT

SMART FLOOD SENSOR

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SMART FLOOD SENSOR

Components and Devices Used:

1) Arduino UNO Board
2) Soil Moisture Sensor Module(Water probs + Measurement Module)
3) 5V Buzzer
4) 3.2V LED Bulb
5) Plastic tray
6) Jumper Cables

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Arduino UNO Board

- The Arduino UNO Board is a microcontroller board based on the ATmega328P.
- It has 14 digital input/output pins (of which 6 can be used as PWM outputs), 6 analog inputs, a 16 MHz ceramic resonator, a USB connection, a power jack, an ICSP header and a reset button.
- Advantages of using an Arduino UNO Board:

1. It is relatively inexpensive.
2. It is easy to use and has a large community of support.
3. It is versatile and can be used to create a wide variety of projects.
4. It is open source, which means that the software and hardware are freely available for anyone to use and modify.

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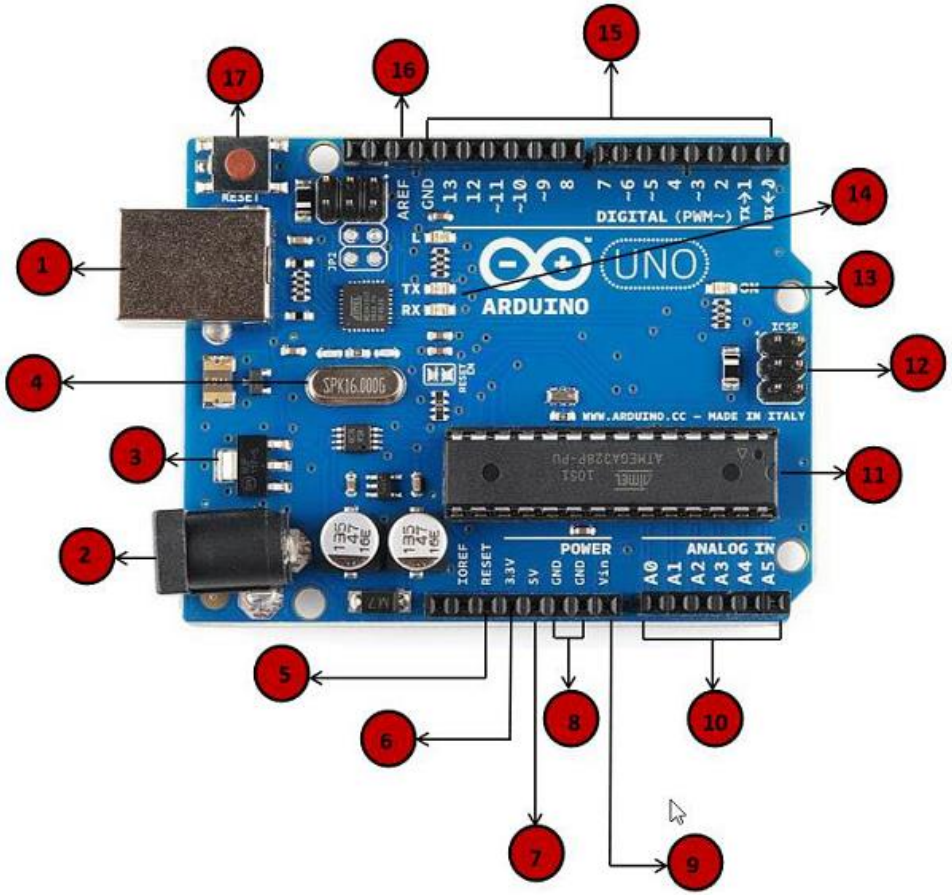
Arduino UNO Board



- 1 - Power USB
- 2 - Power (Barrel Jack)
- 3 - Voltage Regulator
- 4 - Crystal Oscillator
- 5 - Reset
- Pins (6 - 3.3, 7 - 5,
- 8 - GND, 9 - Vin)
- 10 - Analog Pins
- 11 - Main Microcontroller
- 12 - ICSP Pin
- 13 - Power LED Indicator
- 14 - TX and RX LED’s
- 15 - Digital I/O
- 16 - AREF
- 17 - Reset

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Soil Moisture Sensor Module

- The soil moisture sensor is commonly used in smart agriculture or other garden automation projects to measure the moisture content present in the soil.
- It consists of 4 pins in which two pins, VCC and GND are connected to supply voltage. The remaining two pins are digital (D0) and analog (A0) are the output pins.
- The sensor probe will be dipped in the soil and connected to the measurement module. The measurement module will compare the measured value with the set threshold value (can be set using 10k pot) using the LM393 OP-Amp comparator and provide output on the digital pin.

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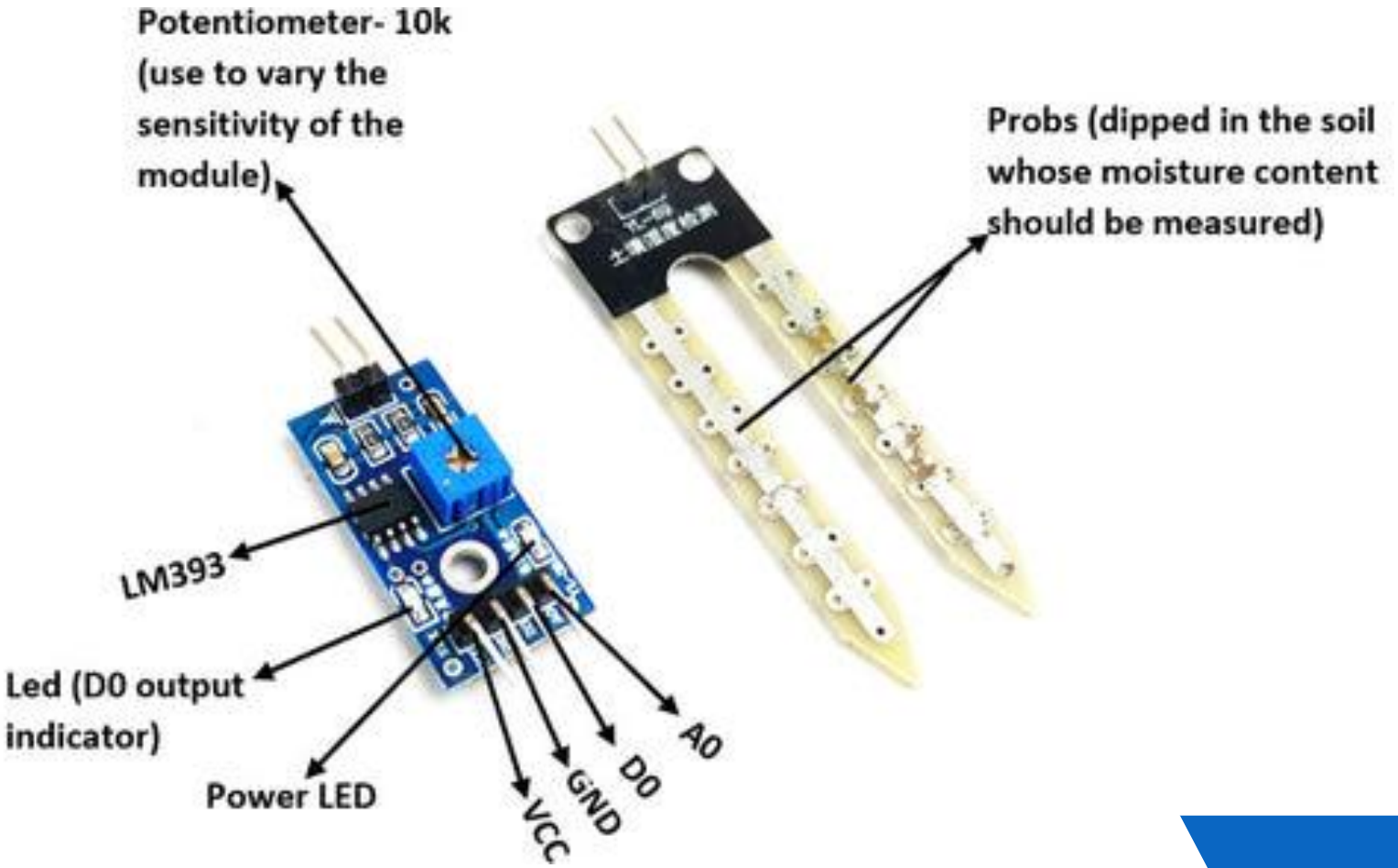
Soil Moisture Sensor Module



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5V Buzzer

- A 5V buzzer is a small, inexpensive electronic device that can generate sound. It is commonly used in Arduino projects to provide audible feedback or alerts.
- 5V buzzers are typically very small and lightweight, making them easy to use in Arduino projects. They are also very inexpensive, often costing less than $1/70 INR.
- To use a 5V buzzer with an Arduino, you will need to connect it to one of the Arduino's digital pins. You will also need to write a sketch that tells the Arduino when to turn the buzzer on and off.

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3-5V LED Bulb

- An LED bulb can be used with an Arduino to create a variety of projects, such as a simple night light or a more complex lighting system. To use an LED bulb with an Arduino, you will need to connect the bulb to an Arduino digital pin and GND pin.

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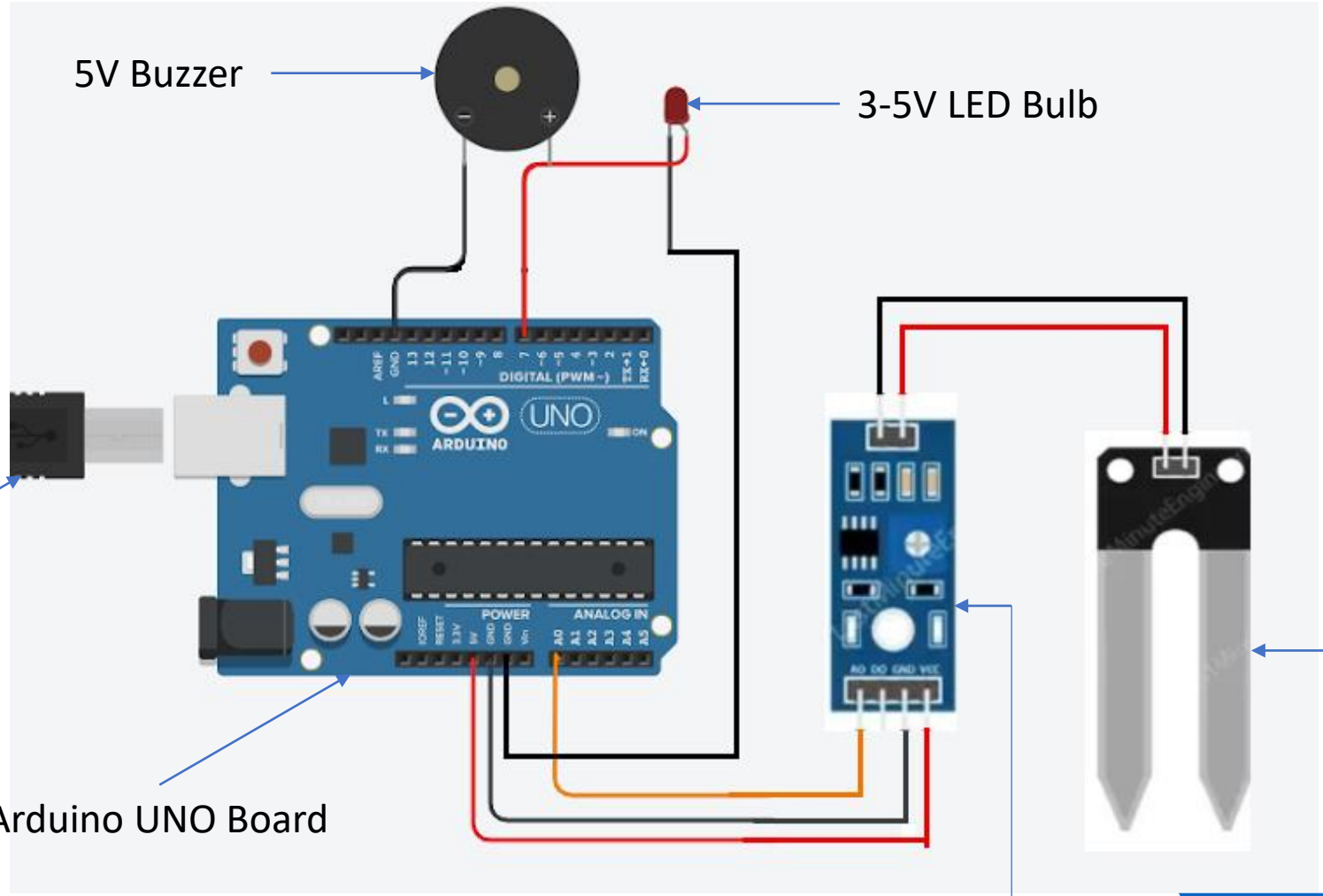
Circuit Diagram:



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Variable Declarations and Connections:

- **floodPin -** Represents the analog pin (A0) to the Arduino UNO Board connected to the moisture sensor.
- **redLED -** Refers to the digital pin (pin 7) to the Arduino UNO Board connected to an LED.
- **thresholdValue -** Adding a threshold value(500) for the soil moisture sensor module.

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Setup() Function:

- **pinMode(floodPin, INPUT);** Configures the rainPin (A0) as an input pin to read analog values from the moisture sensor.
- **pinMode(redLED, OUTPUT);** Sets up the led Pin (pin 7) as an output pin to control the LED (and buzzer).
- **digitalWrite(redLED, HIGH);** This turns on the LED by setting its state to HIGH(5 Volts).

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Applications:

Here are some of the key benefits:

- Early detection and warning
- If upgraded, the project can be used at longer distances.
- Cost Savings

In addition to the advantages listed above, smart flood sensor projects can also be used to:

- Track Water Usage

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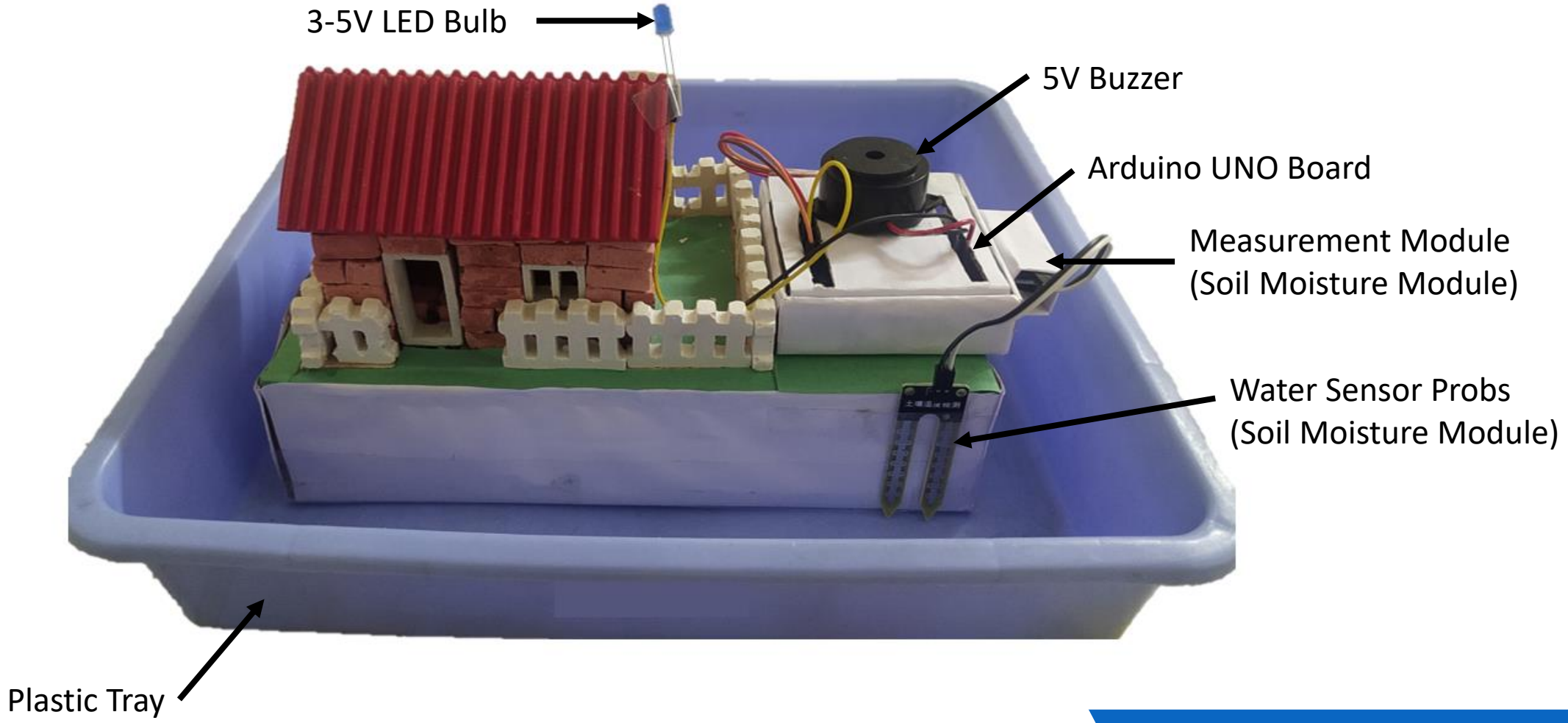
Model:



THANK YOU