# Smart Plant Pot

ENGG 122.02 Final Project

**Members:**
Diaz, Andreas Josef C.
Fernan, Simon Fredrick J.
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**Abstract / Project Description:**

A self-watering plant pot was created with the intention of having monitoring devices for checking ideal conditions for the plants. The Arduino Uno and its connected sensors will give readings of the humidity, temperature, and soil moisture for plant growth monitoring. Specifically, the humidity and temperature would be read by the DHT11 sensor while the soil moisture would be read by the capacitive soil moisture sensor. All of these data are shown in the connected LCD. In addition to that, the device is capable of data logging the said conditions in an SD card every 30 minutes with the help of a real-time clock (RTC). The data logged could then be used for further analysis.

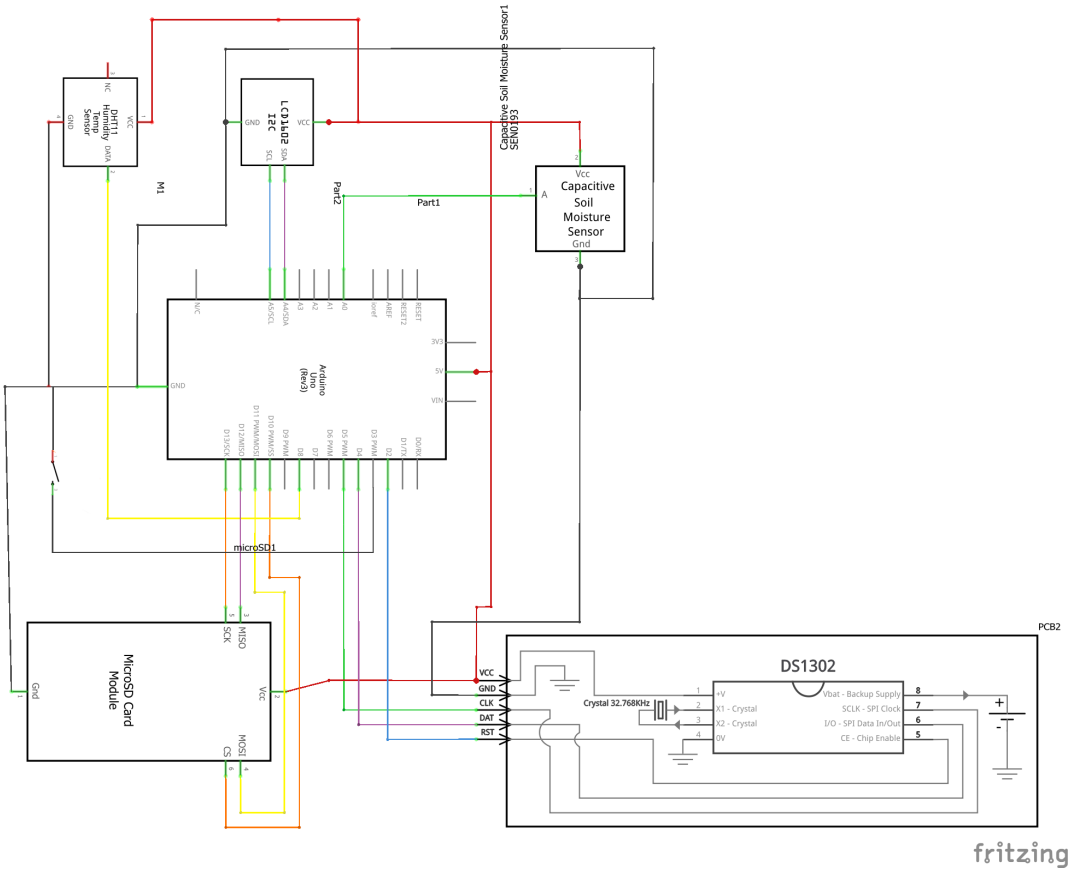
**Features:**

- Capacitive Soil Moisture Sensor Calibration Program
    - It will check the maximum and minimum analog values of a capacitive soil moisture sensor and store it in the EEPROM
- Self Watering Pot
    - 3D Printed
    - Made with PLA (compostable)
- Smart Pot Program
    - Uses the calibration values stored in EEPROM as the basis for the soil moisture %
    - Gets values of humidity, temperature, and soil moisture from the DHT11 and capacitive soil moisture sensors every second
    - Outputs the values on the LCD every second
    - Logs data every 30 minutes
    - LCD backlighting with a button press
    - Stops monitoring when there are errors in certain modules
        - Outputs an error message when the RTC or the DHT11 is disconnected from the Arduino Uno
    - Informs the user if there is an inserted SD card or not
    - If there is no inserted SD card, the program would skip data logging commands.

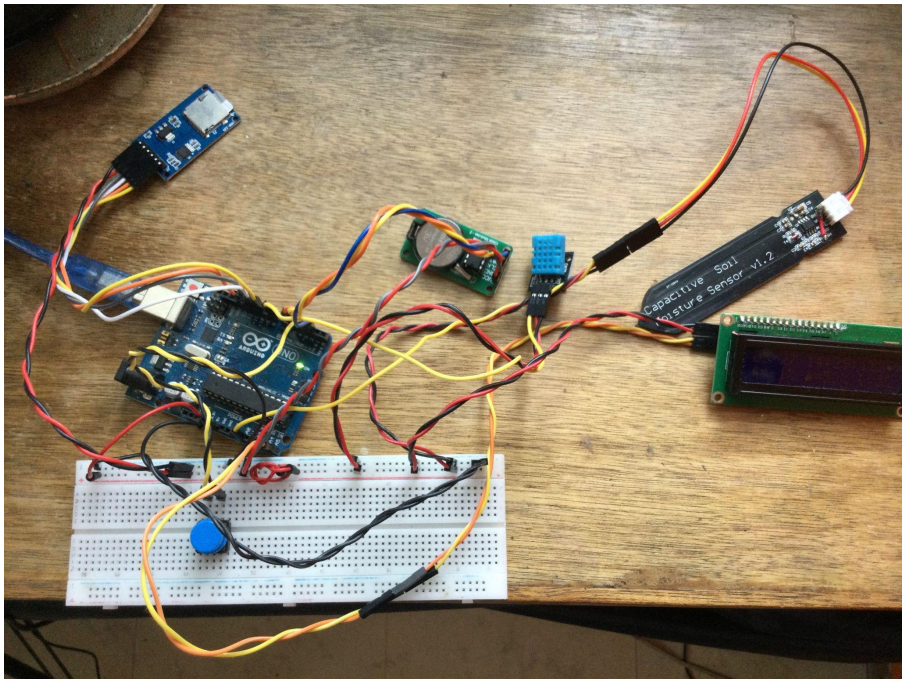
**Important Libraries Installed and Used:**

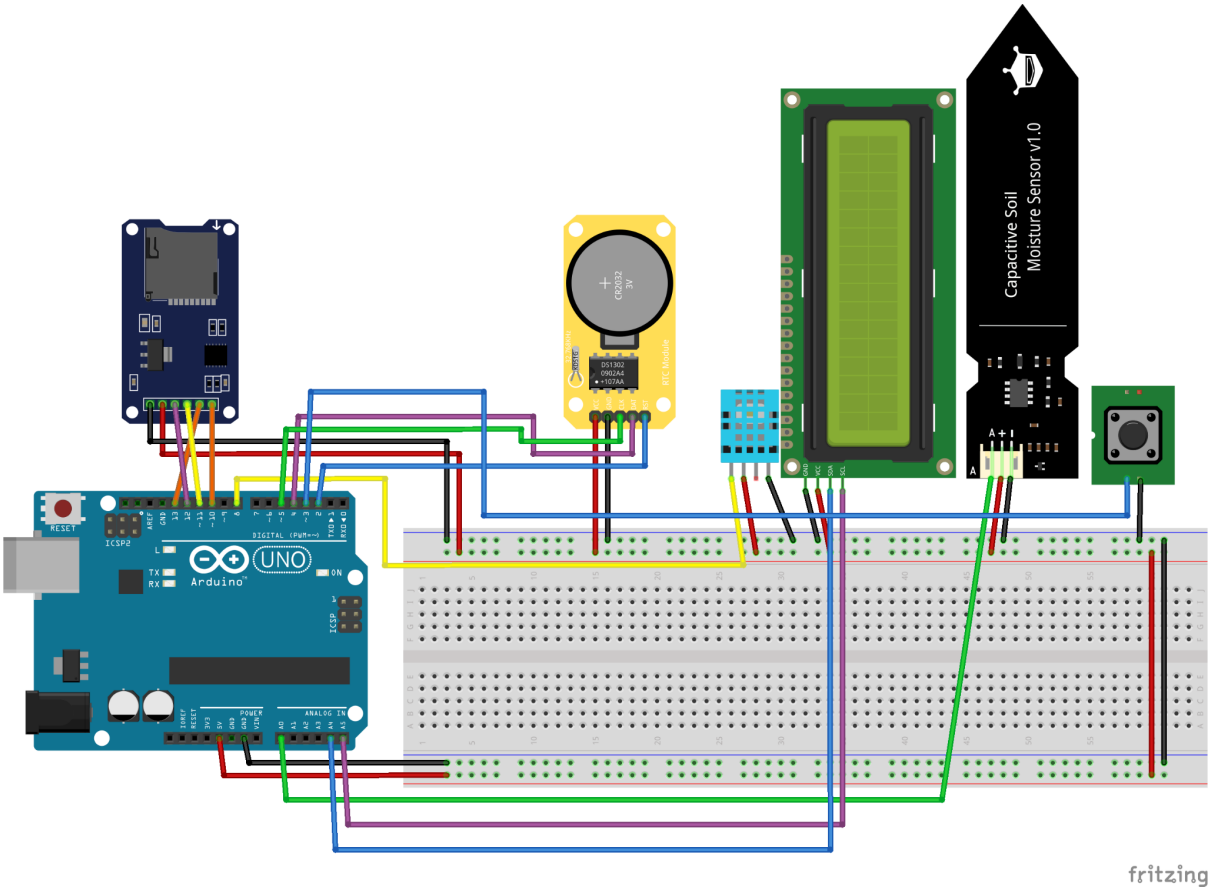
- LiquidCrystal I2C - https://www.arduino.cc/reference/en/libraries/liquidcrystal-i2c/
- DHT https://www.arduino.cc/reference/en/libraries/dht-sensor-library/
  Dependency: Adafruit Unified Sensor Driver
  GitHub - adafruit/Adafruit_Sensor: Common sensor library
- Makuna - for RTC https://github.com/Makuna/Rtc
- SD https://www.arduino.cc/reference/en/libraries/sd/
- EEPROM https://docs.arduino.cc/learn/built-in-libraries/eeprom/

**Schematic Diagram**

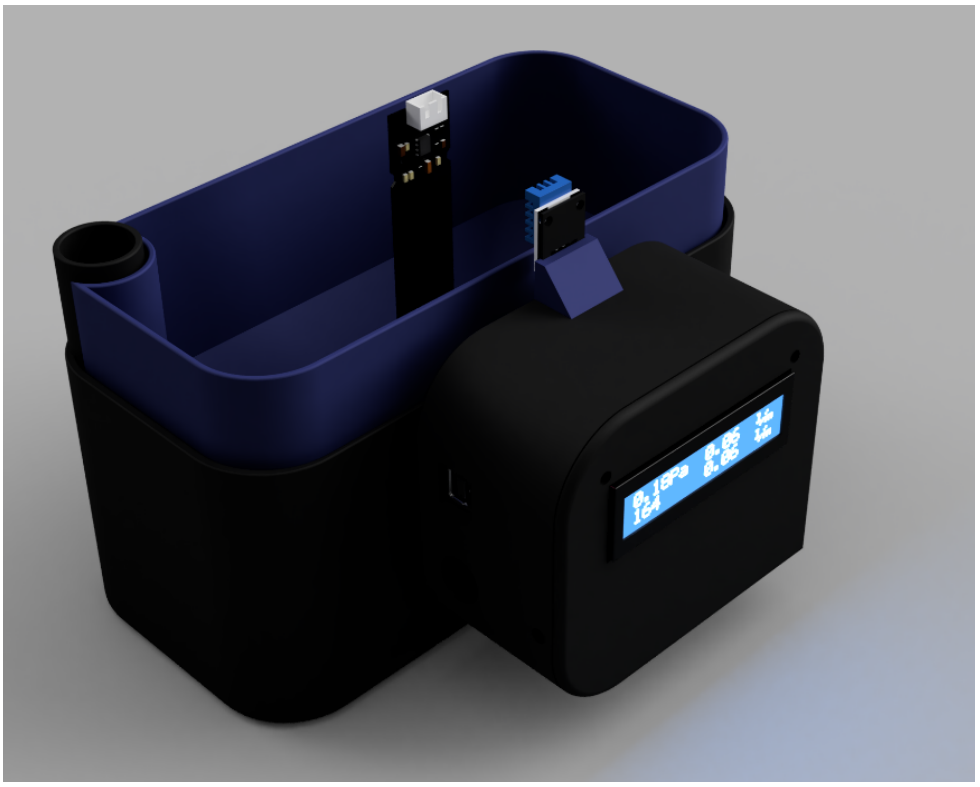


## Image of Arduino Setup



## Image of 3D Printed Pot



## Image of Whole Setup


**Repository for Files**

Please access this Google Drive Folder for the 3D model files, Arduino sketches, high-quality images, and video demos.

Alternatively, you can access this Printables page to get the 3D model files.