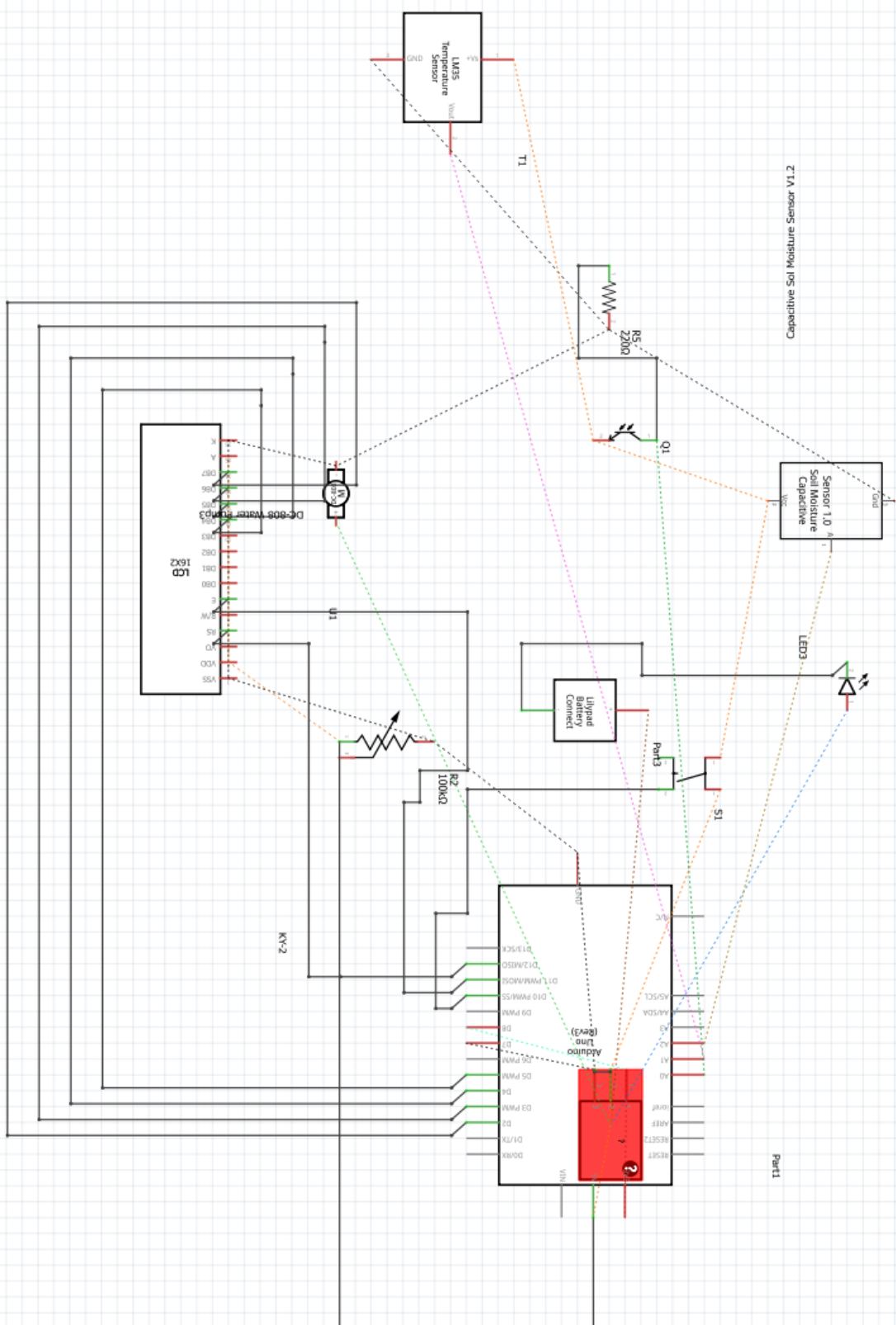
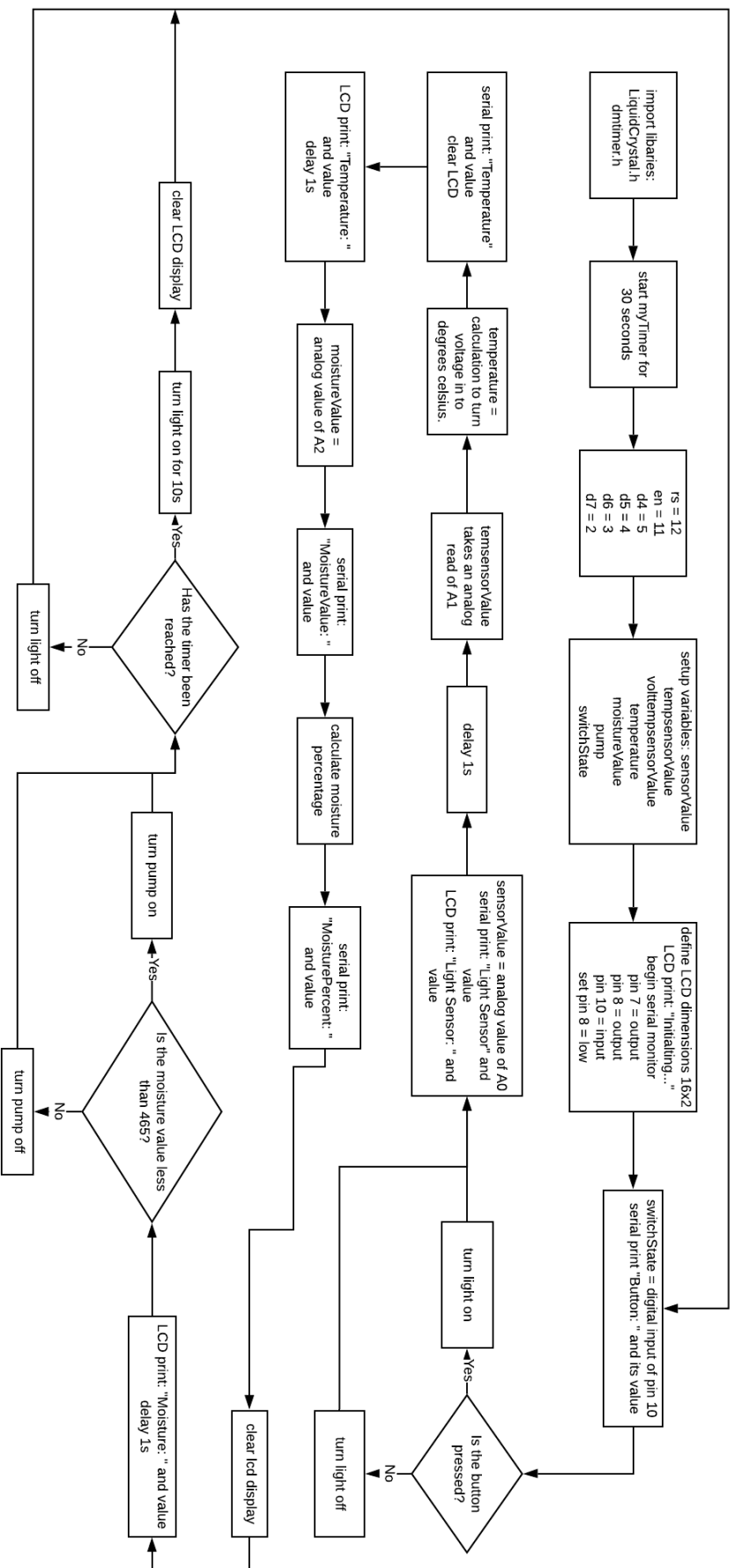




This is a picture of an Automatic plant growing machine that I made using my Arduino Uno. This invention automatically waters your plants for you based on what the moisture values are of the soil. The moisture sensor is just a larger scale capacitive sensor that I ordered from amazon. Once the moisture values drop below a certain voltage the Arduino sets the value of a digital pin, which is already set as an output, to HIGH. This is sent to a relay which turns on the pump. Once the moisture values reach the threshold value the Arduino stops outputting the signal which turns off the pump. It also will turn on the grow light for any time period you set. I installed a library which has a timer that bases its time off the clock speed of the processor on the Arduino. Once the timer event is triggered then an IF statement will tell the Arduino to set a digital pin output value to HIGH which then goes to a relay. This triggers the relay which turns on the light. I set a delay time in the IF statement to give the light time to stay on. Once the delay is over then an ELSE statement turns the light off. The temperature sensor on the board is in Celsius to give you feedback on what the current growing temperature is so you can adjust it accordingly. There is also a phototransistor which is there to ensure that when you set the light to turn on that it turns on. There is an LCD wired into the Arduino. The LCD currently displays three different values: current light level, temperature, and moisture level. There is also a potentiometer to change the brightness of the text on the LCD. There is button wired in to manually turn the light on when pressed.

Part Name:	Quantity:	Link:
Arduino Uno	1	kit
larger breadboard	1	<a href="https://www.amazon.com/SparkFun-Prototyping-Board-500-Pin-Header/dp/B01EV6LJ7G/ref=redir_mobile_desktop?ie=UTF8&amp;aaxitk=w3PAKAim0o-XXVYt-c">https://www.amazon.com/SparkFun-Prototyping-Board-500-Pin-Header/dp/B01EV6LJ7G/ref=redir_mobile_desktop?ie=UTF8&amp;aaxitk=w3PAKAim0o-XXVYt-c</a>
LCD	1	kit
phototransistor	1	kit
potentiometer	1	kit
temperature sensor	1	kit
pushbutton	1	kit
10k ohm reistor	2	kit
5v relay module	2	<a href="https://www.amazon.com/gp/product/B00VRUAHLE/ref=ppx_yo_dt_b_asin_title_o01_s00?ie=UTF8&amp;psc=1">https://www.amazon.com/gp/product/B00VRUAHLE/ref=ppx_yo_dt_b_asin_title_o01_s00?ie=UTF8&amp;psc=1</a>
capacitve soil mositure sensor	1	<a href="https://www.amazon.com/gp/product/B00VRUAHLE/ref=ppx_yo_dt_b_asin_title_o01_s00?ie=UTF8&amp;psc=1">https://www.amazon.com/gp/product/B00VRUAHLE/ref=ppx_yo_dt_b_asin_title_o01_s00?ie=UTF8&amp;psc=1</a>
mini water pump	1	<a href="https://www.amazon.com/gp/product/B07TLRYGT1/ref=ppx_yo_dt_b_asin_title_o02_s00?ie=UTF8&amp;psc=1">https://www.amazon.com/gp/product/B07TLRYGT1/ref=ppx_yo_dt_b_asin_title_o02_s00?ie=UTF8&amp;psc=1</a>
1M vinyl tubing	1	<a href="https://www.amazon.com/gp/product/B07TLRYGT1/ref=ppx_yo_dt_b_asin_title_o02_s00?ie=UTF8&amp;psc=1">https://www.amazon.com/gp/product/B07TLRYGT1/ref=ppx_yo_dt_b_asin_title_o02_s00?ie=UTF8&amp;psc=1</a>
120v light buld	1	<a href="https://www.amazon.com/Philips-Phillips-408662-White-65-Watt/dp/B00F2U2N8U/ref=sr_1_9?dchild=1&amp;keywords=120v">https://www.amazon.com/Philips-Phillips-408662-White-65-Watt/dp/B00F2U2N8U/ref=sr_1_9?dchild=1&amp;keywords=120v</a>
120v flood light housing	1	from home, cannot find anything similar online





Code for project:

```
/*
LiquidCrystal Library - display() and noDisplay()
Demonstrates the use a 16x2 LCD display. The LiquidCrystal
library works with all LCD displays that are compatible with the
Hitachi HD44780 driver. There are many of them out there, and you
can usually tell them by the 16-pin interface.
This sketch prints "Hello World!" to the LCD and uses the
display() and noDisplay() functions to turn on and off
the display.
The circuit:
LCD RS pin to digital pin 12
LCD Enable pin to digital pin 11
LCD D4 pin to digital pin 5
LCD D5 pin to digital pin 4
LCD D6 pin to digital pin 3
LCD D7 pin to digital pin 2
LCD R/W pin to ground
10K resistor:
ends to +5V and ground
wiper to LCD VO pin (pin 3)
Library originally added 18 Apr 2008
by David A. Mellis
library modified 5 Jul 2009
by Limor Fried (http://www.ladyada.net)
example added 9 Jul 2009
by Tom Igoe
modified 22 Nov 2010
by Tom Igoe
modified 7 Nov 2016
by Arturo Guadalupi
This example code is in the public domain.
http://www.arduino.cc/en/Tutorial/LiquidCrystalDisplay
*/
// include the library code:
#include <LiquidCrystal.h>
#include <dmtimer.h>
DMTimer myTimer(30000000); //Create a timer and specify its interval in microseconds 30 sec
// initialize the library by associating any needed LCD interface pin
// with the arduino pin number it is connected to
const int rs = 12, en = 11, d4 = 5, d5 = 4, d6 = 3, d7 = 2;
int sensorValue;
int tempsensorValue;
int volttempsensorValue;
int temperature;
int moistureValue;
int pump;
int switchState;
LiquidCrystal lcd(rs, en, d4, d5, d6, d7);
```

```

void setup() {
  // set up the LCD's number of columns and rows:
  lcd.begin(16, 2);
  // Print a message to the LCD.
  lcd.print("Initiating ...");
  //begin serial
  Serial.begin(9600);
  pinMode(7, OUTPUT);
  pinMode(8, OUTPUT);
  pinMode(10, INPUT);
  digitalWrite(8, LOW);
}

void loop() {
  // determine state of switch
  switchState = digitalRead(10);
  Serial.print("Button: ");
  Serial.println(switchState);
  // turn light on manually from button
  if (switchState == HIGH)
  {
    digitalWrite(8, HIGH);
  }
  else if (switchState == LOW)
  {
    digitalWrite(8, LOW);
  }
  // Turn on the display:
  lcd.display();
  // Clear Display
  lcd.clear();
  // Read Value of photoresistor
  sensorValue = analogRead(A0);
  Serial.print("Light Sensor: ");
  Serial.println(sensorValue);
  // Print value of photoresistor
  lcd.println("Light Sensor:");
  lcd.println(sensorValue);
  delay(1000);
  // Read value of TMP Sensor
  tempsensorValue = analogRead(A1);
  float volttempsensorValue = (tempsensorValue / 1024.0) * 5.0;
  // output value of temp sensor to COM3
  Serial.print("tempsensevoltage: ");
  Serial.println(volttempsensorValue);
  // converting analog temp sensor to celsius
  float temperature = (volttempsensorValue - 0.5) * 100;
  // output to COM3
  Serial.print("Temp: ");
  Serial.print(temperature);
  lcd.clear();
  // output to LCD displaying temp
  lcd.print("Temperature: ");
  //lcd.setCursor(0, 1);

```

```

lcd.println(temperature);
lcd.print("C");
delay(1000);
// getting moisture value
moistureValue = analogRead(A2);
// output to COM3
Serial.print("MoistureValue: ");
Serial.println(moistureValue);
float moisturePercent = -(moistureValue - 465);
Serial.print("MoisturePercent: ");
Serial.println(moisturePercent);
lcd.clear();
// output to LCD displaying moisture percentage
lcd.print("Moisture: ");
lcd.println(moisturePercent);
delay(1000);
// determining the range for watering
if (moistureValue < 465)
{
    digitalWrite(7, HIGH);
}
else
{
    digitalWrite(7, LOW);
}
// Turns the light on and off based on the timer value
// check if execution time has been reached
if (myTimer.isTimeReached()) {
    //call what you need
    digitalWrite(8, HIGH);
    delay(10000); // 10 seconds
    lcd.clear();
}
else {
    digitalWrite(8, LOW);
}
}

```