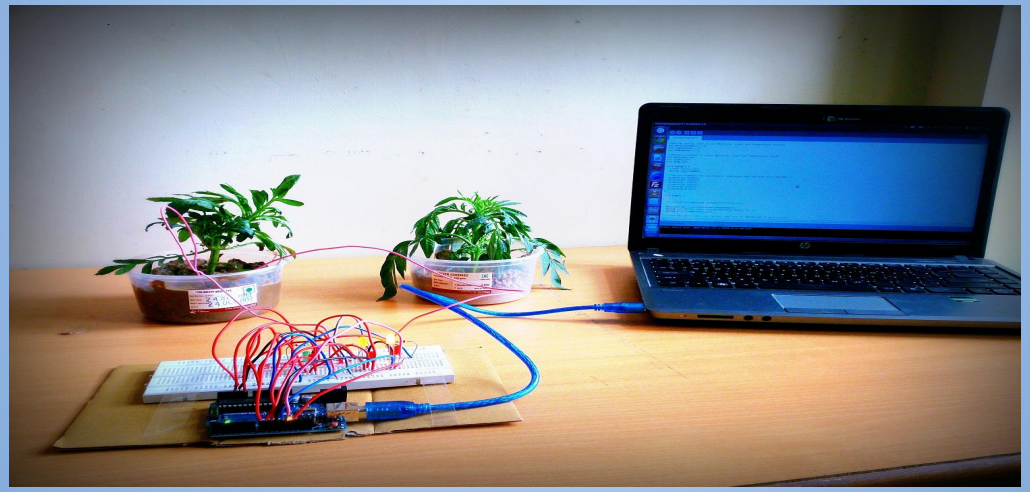
Garduino

An Arduino based Automated Garden Controller



Dr. S.K Singh, MIP-332 (Mini Project)

Introduction

Our Garduino garden controller uses an **Arduino microcontroller** to run our indoor garden, watering the plants only when they're thirsty, turning on supplemental lights based on how much natural sunlight is received, and alerting us if the temperature drops below a plant-healthy level. For sensors, the Garduino uses an inexpensive **photocell** (light), **thermistor** (temperature), and a pair of normal hook-up wires (moisture).

Problem Statement

The real-life problem that we face in Agriculture and Horticulture is that the moisture (irrigation), heat and light that are provided to plants have no check at all. Therefore, the farmers and agriculturists have no way to determine if the plants are getting the perfect and favourable mix of water, light energy and heat for its growth.

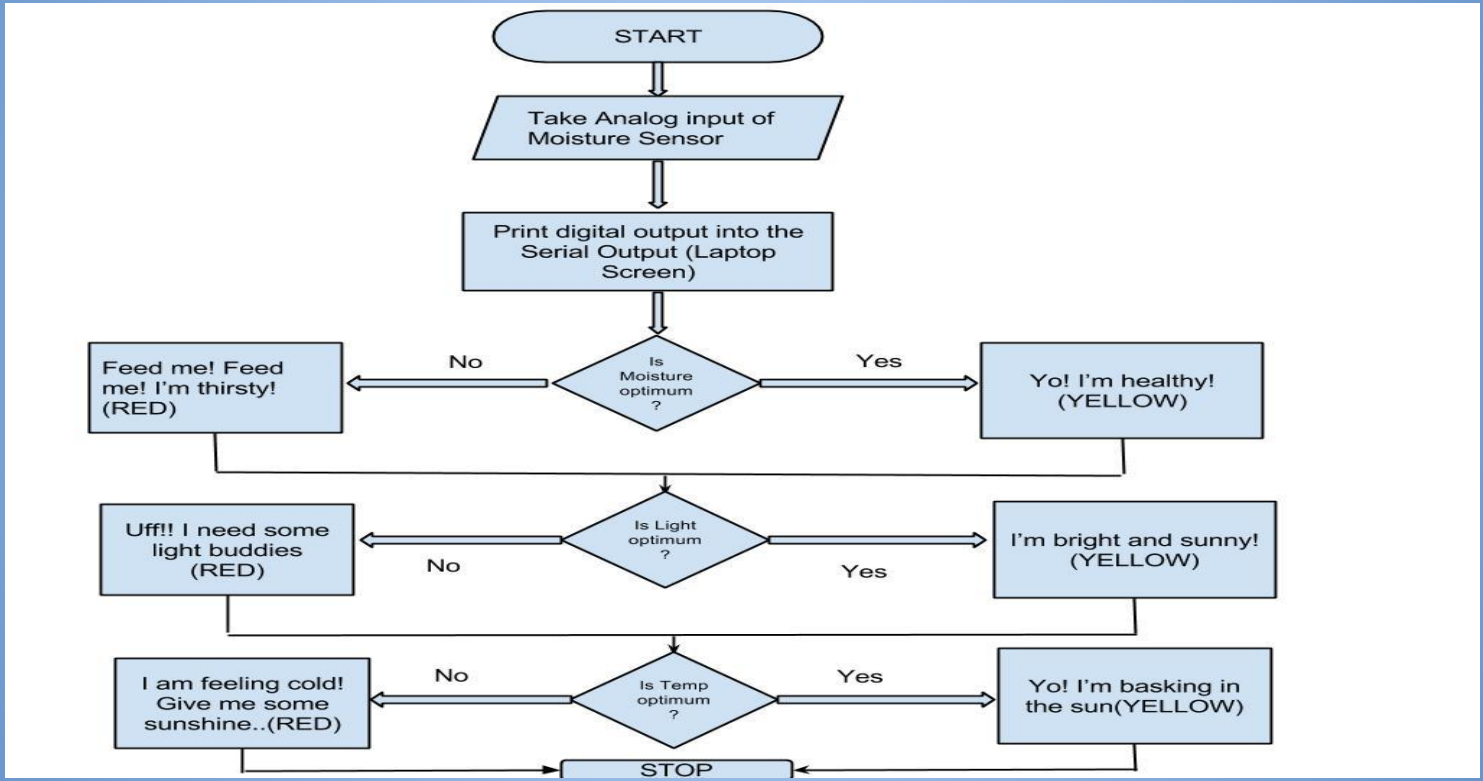
The task is to come up with an automated setup which electronically monitors the moisture, light and heat required for the favourable growth of the plant (which will be unique for each plant and will have to be tested before use) and provide warnings if they are not within the desired levels.

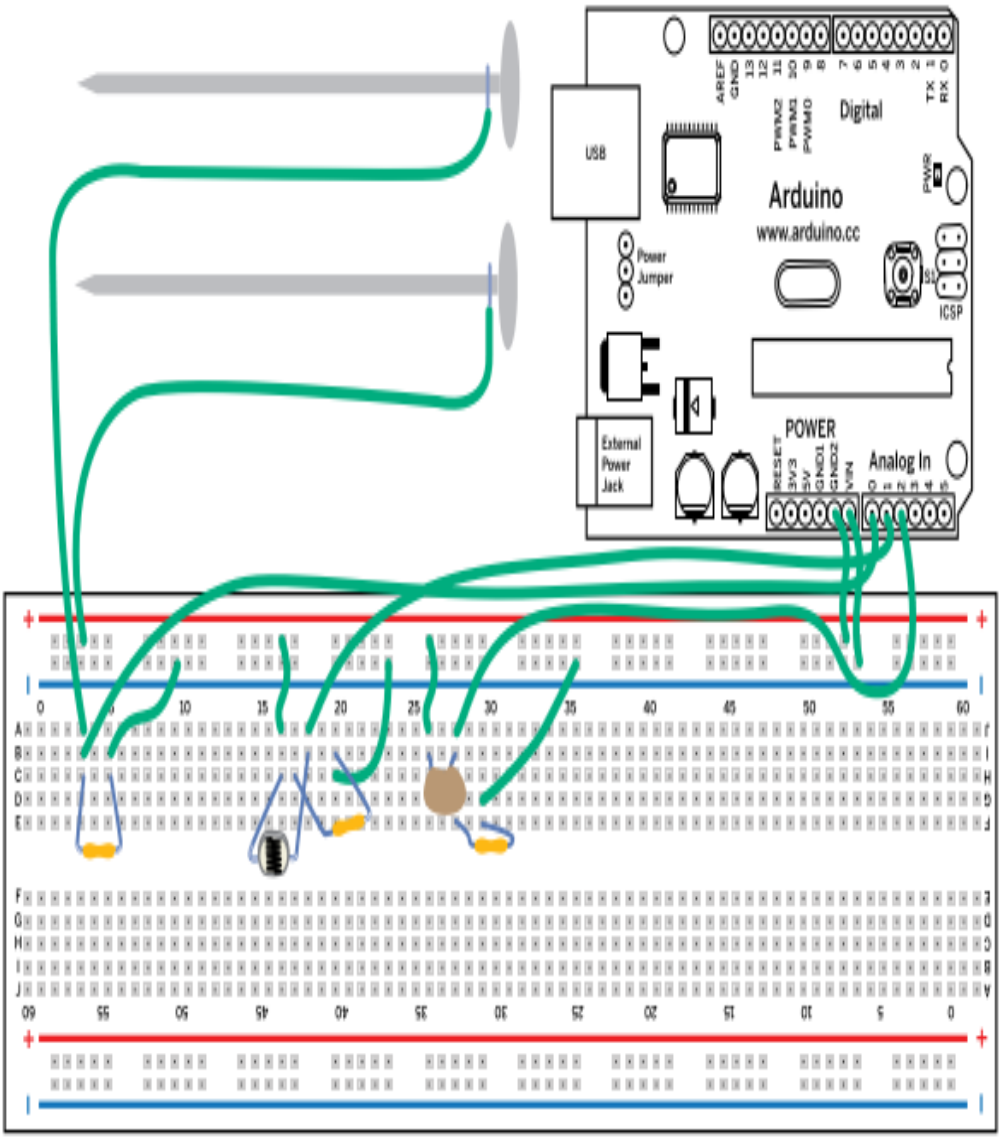
For this favourable growth of the plant, Garduino will prove to be very beneficial. Also being inexpensive and portable will serve our purpose fully.

SOLUTION

- We created an Electronic Microcontroller Circuit with the help of Arduino Uno R3™ that monitors, checks and controls the moisture, light and temperature levels.
- We placed red and yellow LEDs on the breadboard which will glow according to the different values given by the sensors.The red LED will glow when the values given by the sensors embedded on Arduino is less than the optimal value and the yellow LED will glow whenever the values are in the optimum limit and message will be flashed accordingly.

FLOWCHART


START
Take Analog input of Moisture Sensor
Print digital output into the Serial Output (Laptop Screen)
Is Moisture optimum ?
No
Yes
Feed me! Feed me! I'm thirsty! (RED)
Yo! I'm healthy! (YELLOW)
Is Light optimum ?
No
Yes
Uff!! I need some light buddies (RED)
I'm bright and sunny! (YELLOW)
Is Temp optimum ?
No
Yes
I am feeling cold! Give me some sunshine..(RED)
Yo! I'm basking in the sun(YELLOW)
STOP


USB
Power Jumper
External Power Jack
Arduino
www.arduino.cc
Digital
POWER
Analog In
ICSP
AREF
GND
13
12
11
10
9
8
7
6
5
4
3
2
TX → 0
RX ← 1
PWM2
PWM1
PWM0
RESET
3V3
5V
GND1
GND2
VIN
0 1 2 3 4 5

Future and use

- Garduino would prove to be a boon not only in large tracts of agricultural land, but in controlled indoor environment such as greenhouses and nurseries, where the exact and optimum conditions for plant growth must be known.
- The greatest benefit of this project is that no external sensors are used, as all the sensors are made from inexpensive components that are directly embedded into Arduino Uno R3 Microcontroller.

- This product can also be commercialized, especially for use in large farms, and in horticulture, Eg. Nurseries. For any given Plant, say Plant X, we shall test the optimum Digital Output Values from the Arduino for 2-3 days, and then with the obtained Optimum values, we shall create the Microcontroller circuit specific to the plant.
- Extending the Garduino, we can also add water pumping motor, fluorescent bulb and heater/fan, according to the moisture value, temperature value and the value from the photo-sensor.

THANK YOU

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