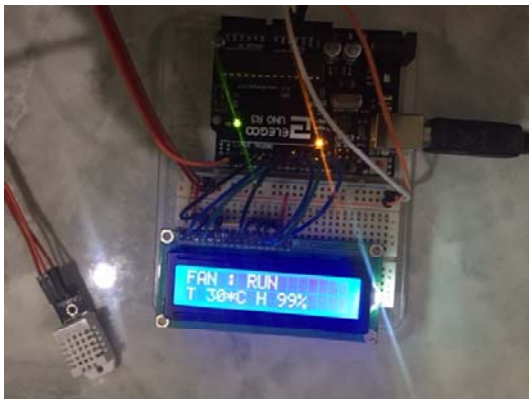# Ventilation Control base on

Temperature and Humidity Condition


By Agus Hariyadi

@2018

**First, We need to prepare all the equipment for this experiment..**

1. Arduino UNO board.
2. DHT 22 or DHT 11 sensor for temperature and humidity condition
3. Mechanical Fan for controlling the ventilation.
4. LCD 16 x 2 for displaying the current condition
5. Bread board for assembling the circuit.
6. Relay for activating the mechanical Fan.
7. Adaptor 5V or 9V for powering the Arduino and relay.
8. Arduino file venControl22.ino
9. Library file SimpleDHT-1.0.6.zip

**Second, We need to check that the Arduino is working properly.**

1. Download the Arduino IDE from https://www.arduino.cc/en/Guide/Windows
2. After download then Install it.
3. Just follow the instruction until finished installing software and driver for Arduino.
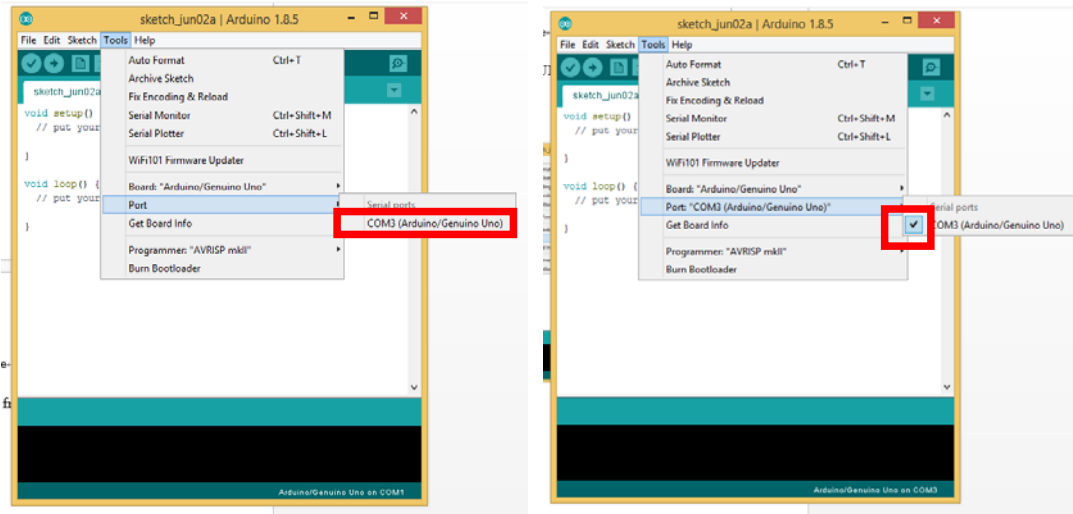4. Run the Arduino IDE software and get this window
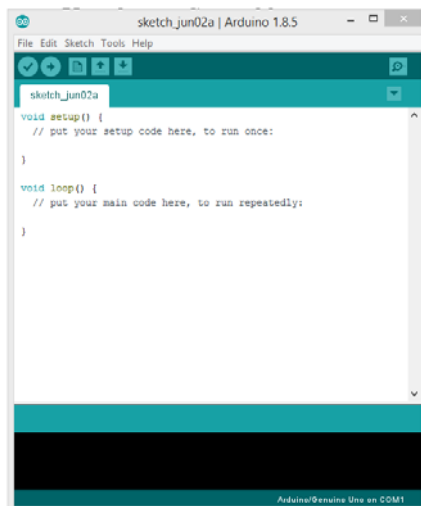
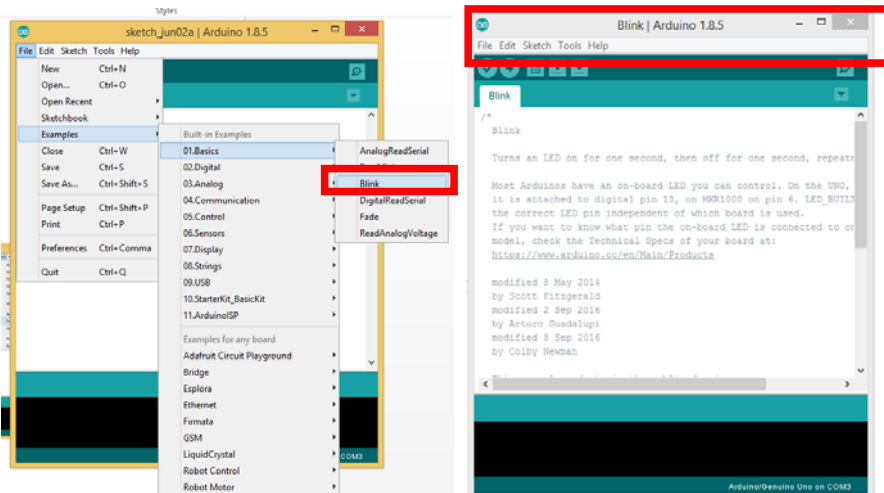5. Connect the Arduino to the PC using USB cable
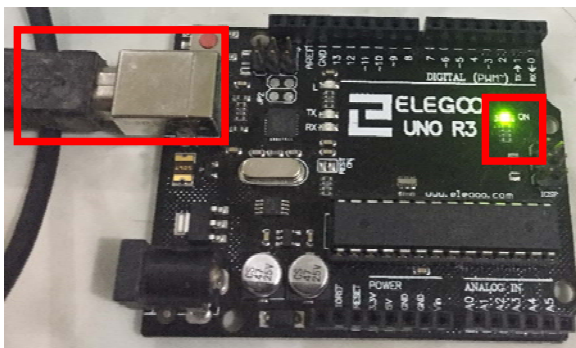
6. Go to TOOLS and choose Arduino/Genuino UNO from the list (if we use Arduino UNO board)
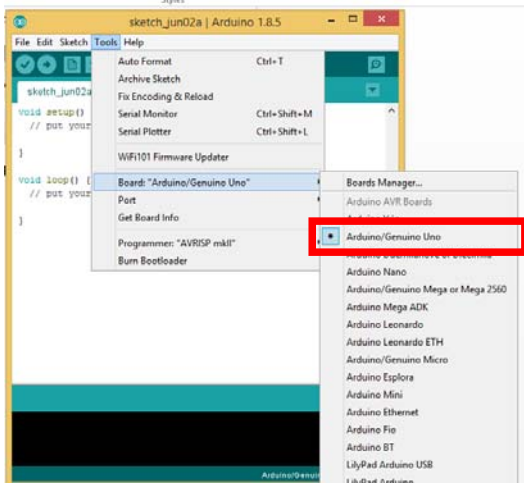
7. Then choose the COM port

8. After successfully connected to the Arduino, try "Blink" example file

9. Click verify and wait until done compiling

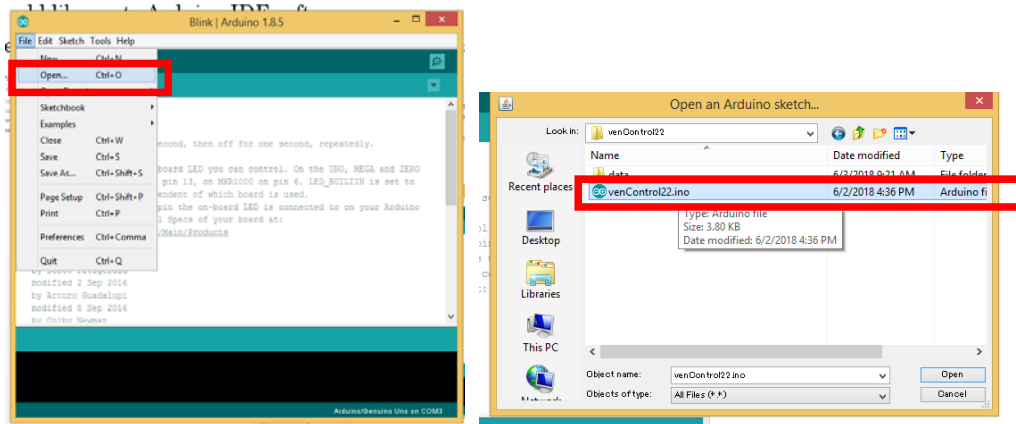10. Next step is upload the "Blink" program to the Arduino

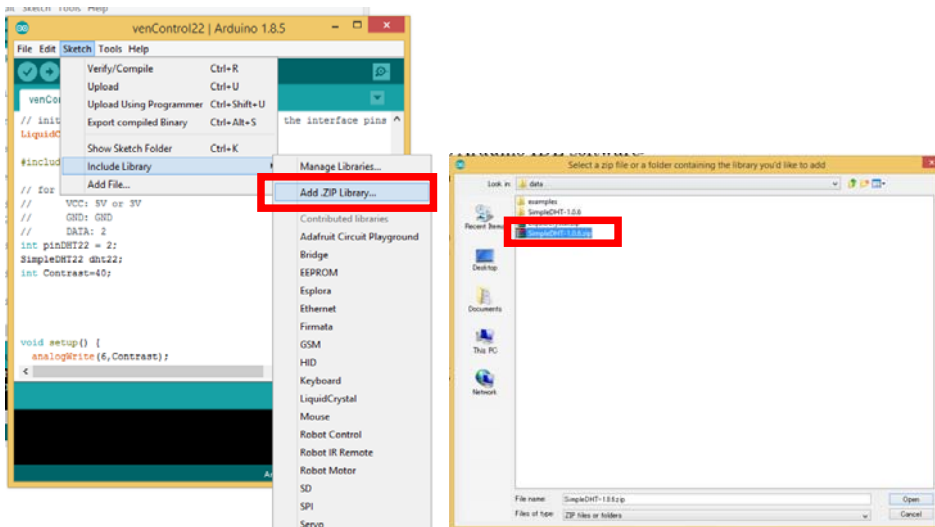11. Now you should get "*blink*" program to your Arduino.

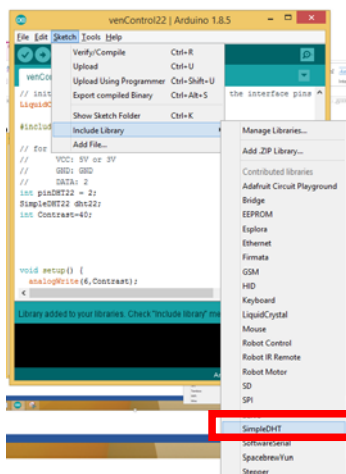### Third, add library to Arduino IDE software

1. Open the venControl22.ino file from your computer using Arduino IDE software
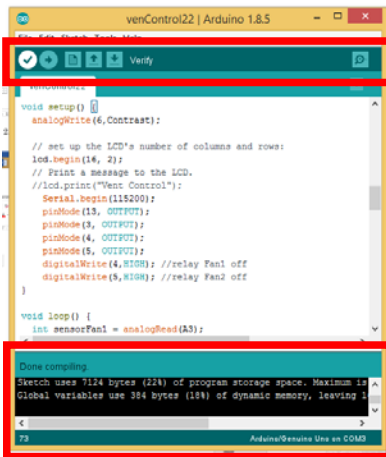

2. Then we need to add library SimpleDHT.zip to Arduino IDE by open Sketch and choose SimpleDHT-1.0.6.zip

3. Check the library that we already add in the Sketch, include library.

4. Then we can verify our program using the same step like before.

5. If there isn`t error, we can continue to upload the program to Arduino board.

6. After uploading the program, now we can check the result by opening the serial monitor. If you can read the word inside the serial monitor ("Sample DHT22..."), then the program is OK and we can continue to the next step. Although it says "Read DHT22 failed; err =101" but it is OK because we haven`t connect the DHT22 sensor yet.
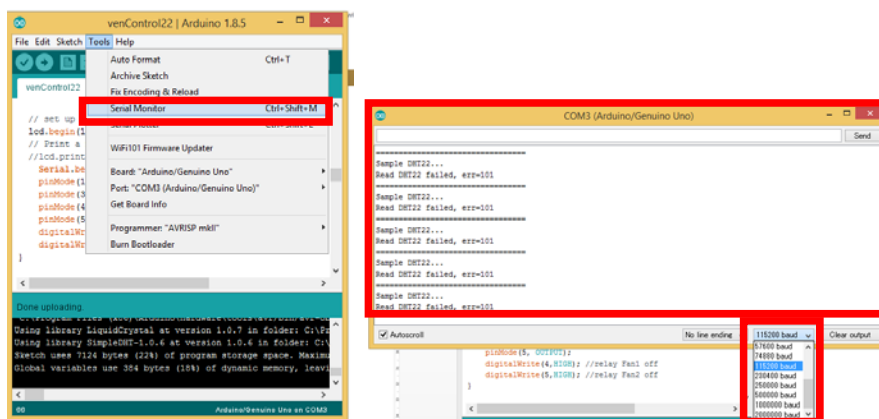
Fourth, assembling the component connected to the Arduino.

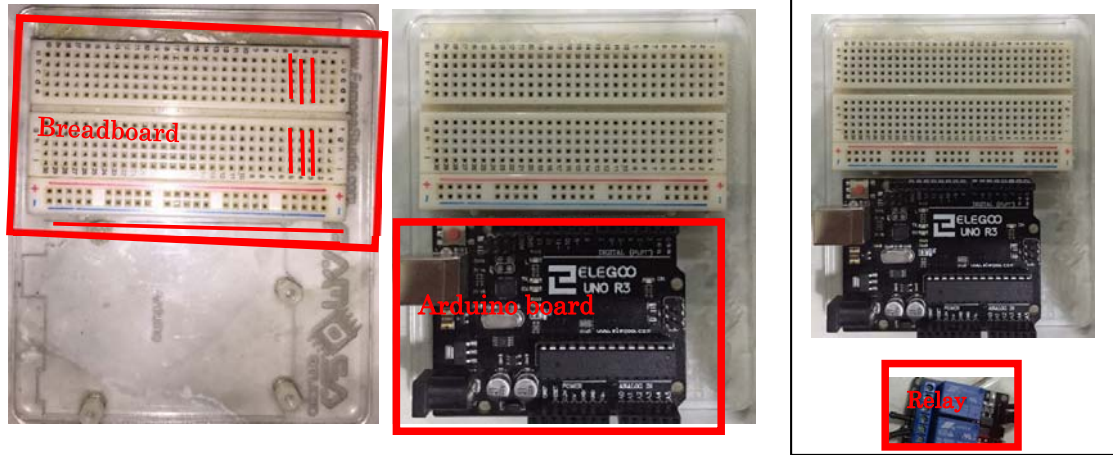1. Setting up Arduino board and breadboard.   It`ll be better if we can make an acrylic board using laser cutter to place Arduino board, breadboard and relay board in one nice place together.


2. Leave the row f in the breadboard for placing the LCD pin later. We can use already made clip or make it from ordinary paper clip to connect line VSS (number 1), line RW (number 5), and line K (number 16) to line (-) in the breadboard. Then connect line VDD (line 2) and line A (number15) to line (+). After that we can put LCD pin in the **f** row start from line number 1 to 16.
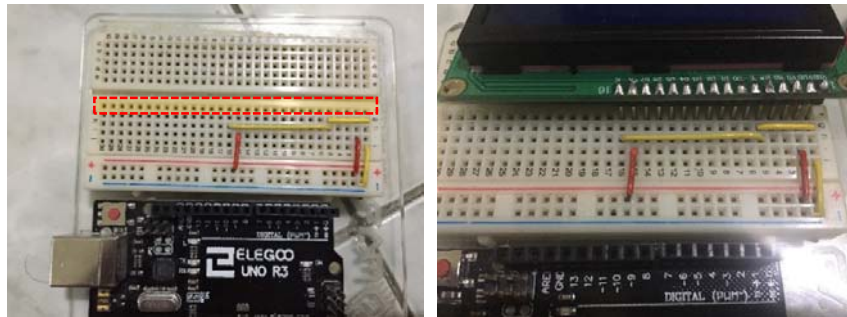
3. Next step is connected the remaining LCD pin with Arduino pin using jumper cable.
   a. Pin V0 (number 3) with pin 6 in Arduino.
   b. Pin RS (number 4) with pin 7 in Arduino.
   c. Pin E (number 6) with pin 8 in Arduino.
   d. Pin D4 (number 11) with pin 9 in Arduino.
   e. Pin D5 (number 12) with pin 10 in Arduino.
   f. Pin D6 (number 13) with pin 11 in Arduino.
   g. Pin D7 (number 14) with pin12 in Arduino.

<table>
<tr><td> a.</td><td> b.</td></tr>
<tr><td> c.</td><td> d.</td></tr>
<tr><td> e.</td><td> f.</td></tr>
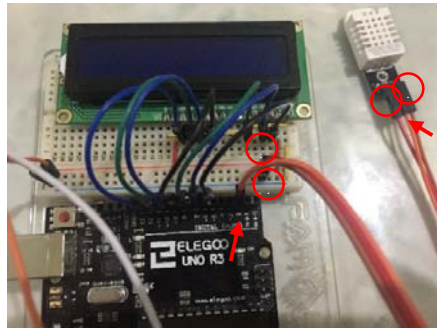<tr><td> g.</td><td></td></tr>
</table>
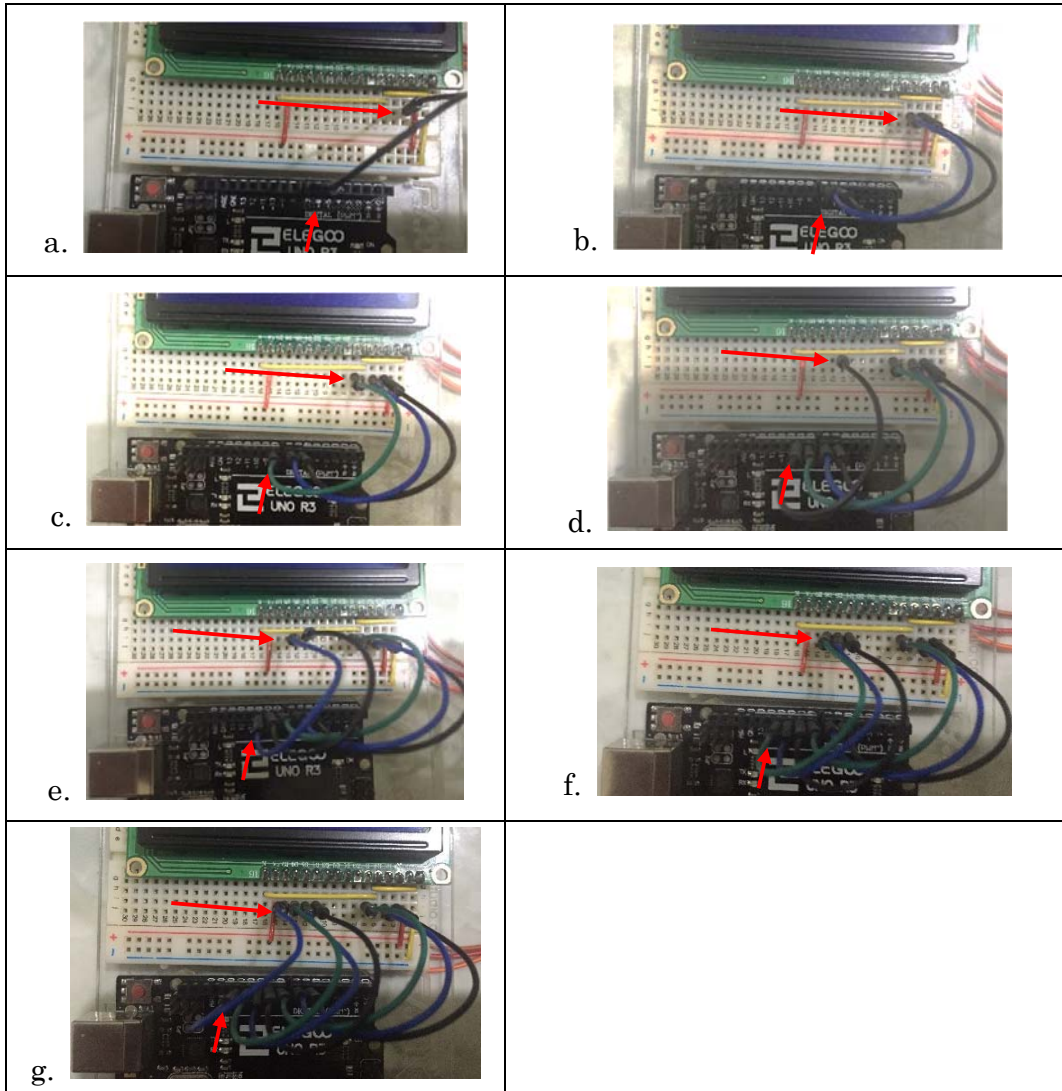
4. Next step is connected pin 5 V from the Arduino to pin (+) in the breadboard and pin GND (ground) from the Arduino to the pin (-) in the breadboard.
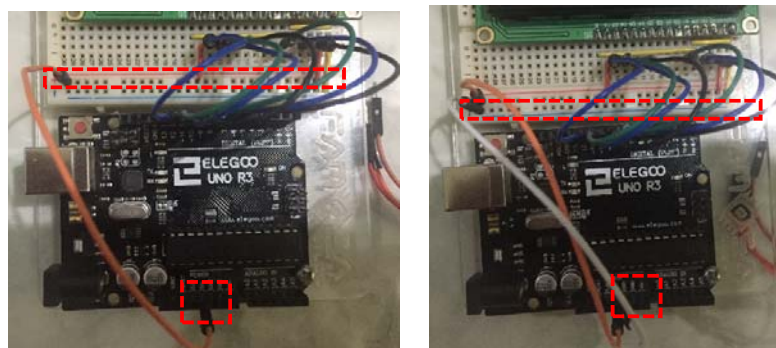
5. Then we need to connect our DHT 22 pin sensor (middle pin) with the pin 2 in the arduino. While pin (+) in the sensor can be connected to the pin (+) in the

breadboard, and pin (-) in the sensor can be connected to the pin (-) in the breadboard also.


6. Next step is to power up the arduino board using 5Volt via USB cable or 9 Volt adaptor to see if the system and the sensor working correctly or not (LCD will show the current condition). When the humidity less than 75%, the led in the arduino is OFF, but when the humidity more than 75% (we can make this condition by blowing the sensor with our mouth), the led will be ON.

7. The next step is connect the relay component to the arduino using the same method when we connected the sensor. Pin IN1 from relay can be connected to pin 5 of the arduino board. Then the pin VCC in the relay can be connected to pin (+) in the breadboard while pin GND in the relay will be connected to the pin (-) in the breadboard. After powering ON the arduino, the relay LED will be turn on if the humidity condition is more than 75%.
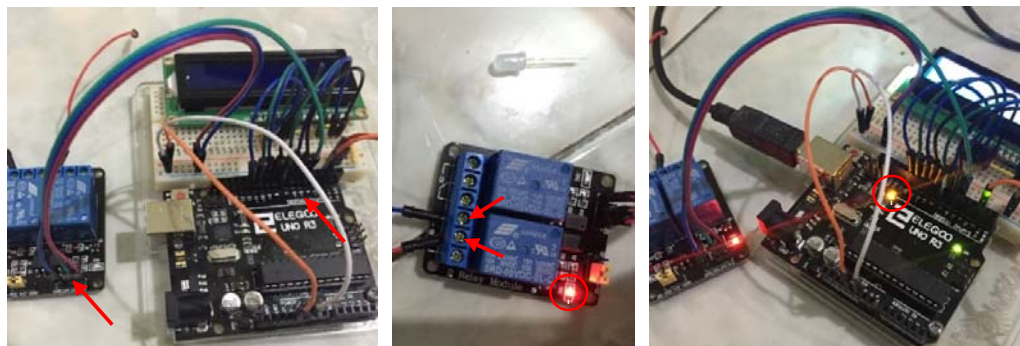
8. To test the relay functionality, we can use the pin 13 from the arduino and connected to the pin neutral K1 (middle) and then pin open K1 (right) to the pin in the column 30 of the breadboard. We also need to put pin in column 29 connected to pin (-) of the breadboard. Put an LED in the breadboard with long foot connected to pin in column 30 and short foot connected to pin in column 29. When the FAN information says RUN (humidity condition is more than 75%), the LED should be ON.
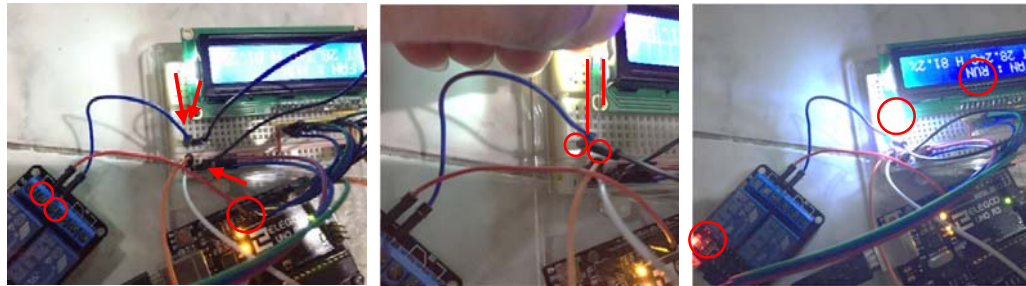
9. Last step is connecting the relay with power cord (do this step with caution because it will connecting with 110 Voltage). The connection is very simple, it only use one of the power cord line to the relay which will played as an ON/OFF button for mechanical Fan. The length of the cable to the relay board is free, it can be short or use the same length with the adaptor cable to the arduino board. The end of the cable can be connected direcly to the mechanical Fan or power terminal for mechanical Fan.
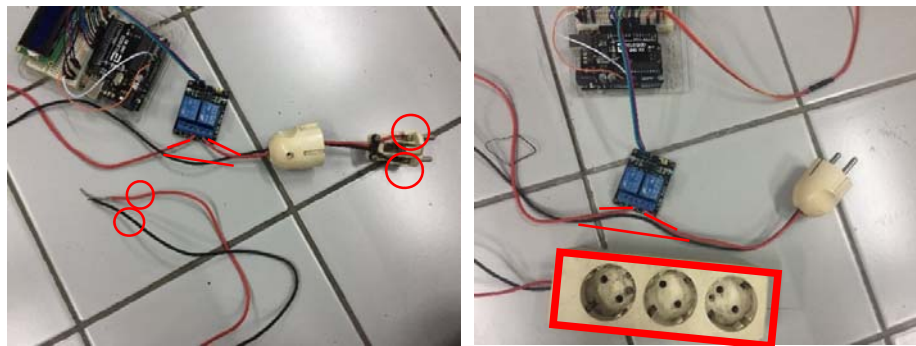
10. Additional step is running TEST the tools. There are two power line that we need to make it run, first is powering the arduino board using 5V or 9V adaptor and the second is powering the mechanical Fan through the relay board. In this example, I use ordinary Fan to be plugged in the terminal cord from relay. When the humidity condition is more than 75%, the Fan will ON and when the humidity condition is less than 75%, the Fan will OFF.

That`s All..

Good luck.

Ganbatte..