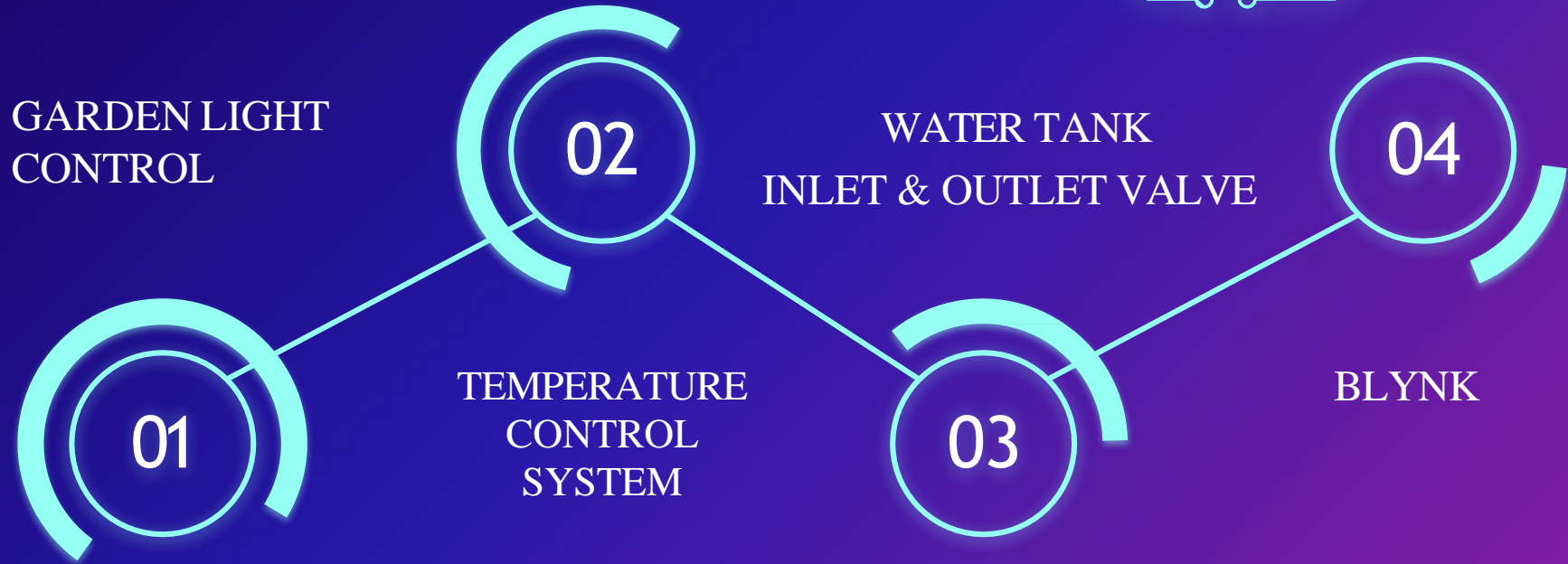


# HOME AUTOMATION

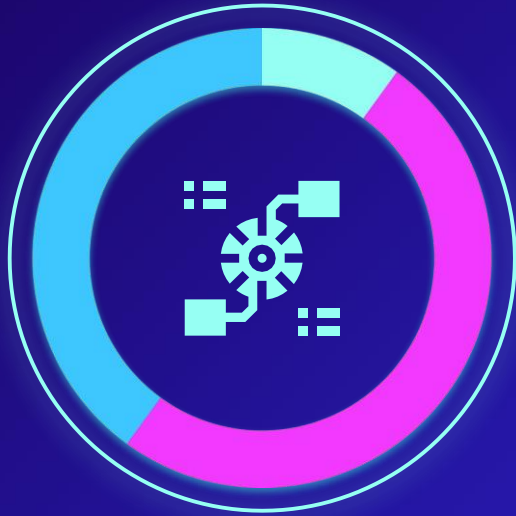
AFRITH.S  
IIT TIRUCHIRAPPALLI



# PROJECT REQUIREMENTS



# SOFTWARES USED

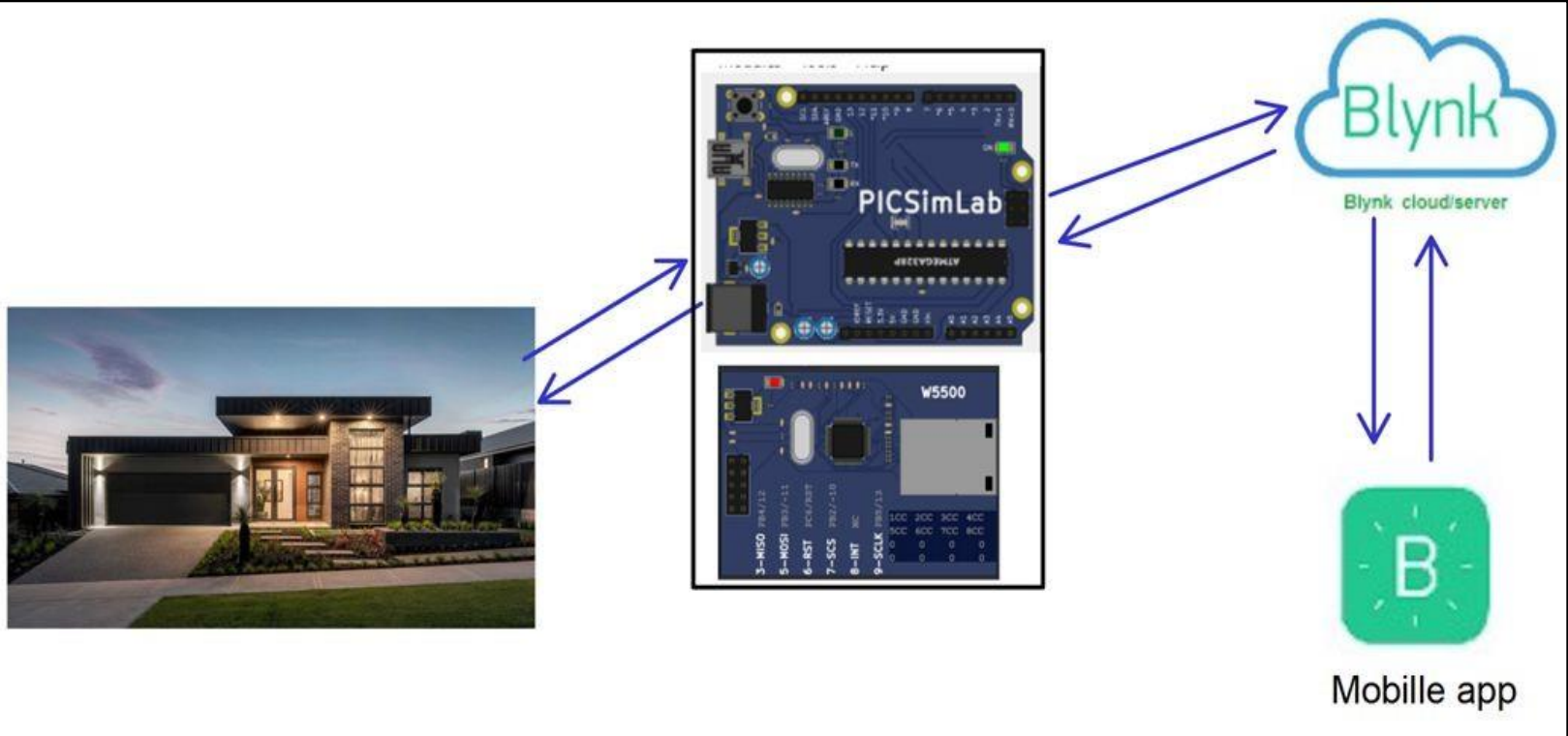


1 ARDUINO IDE

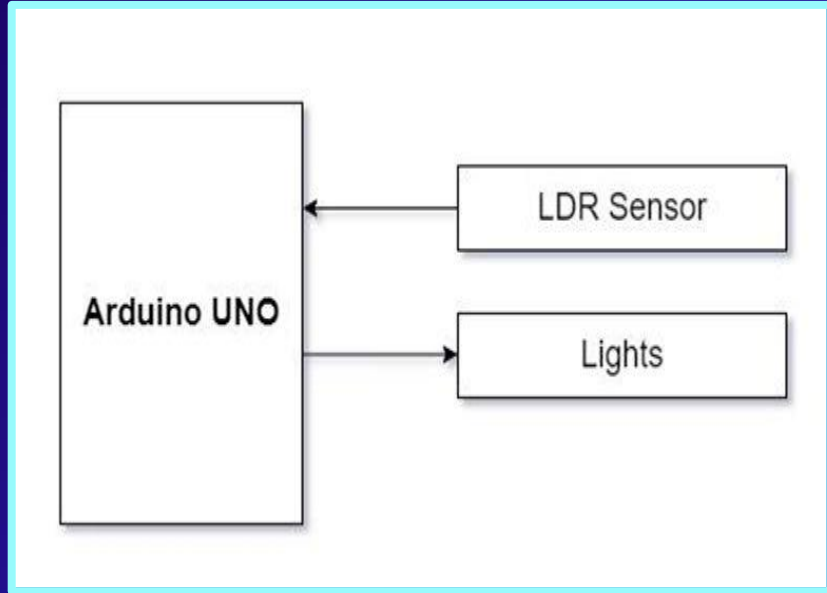
2 PICSIMLAB

3 BLYNK APP

# HOME AUTOMATION PROJECT REQUIREMENTS



## GARDEN LIGHTS CONTROL

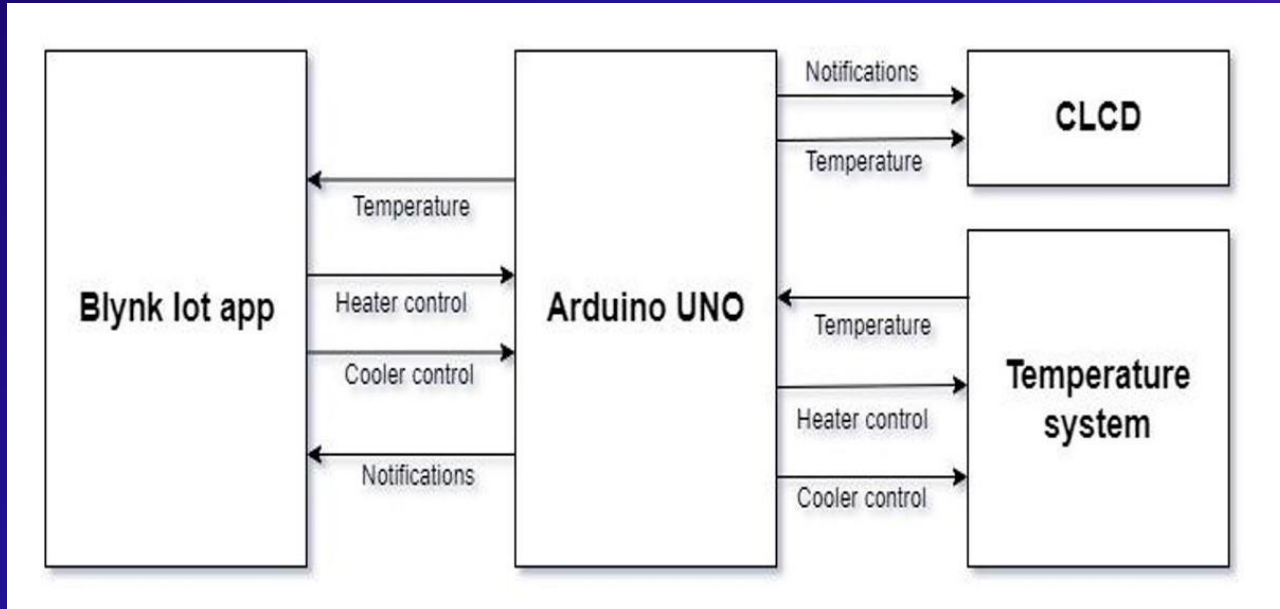


The process involves reading the LDR sensor value, and based on the reading, adjusting the brightness of the LED to mimic garden lights that automatically adjust their brightness based on the availability of sunlight. This is achieved by varying the voltage supplied to the LED based on the LDR reading.

More sunlight : Less Resistance: More voltage

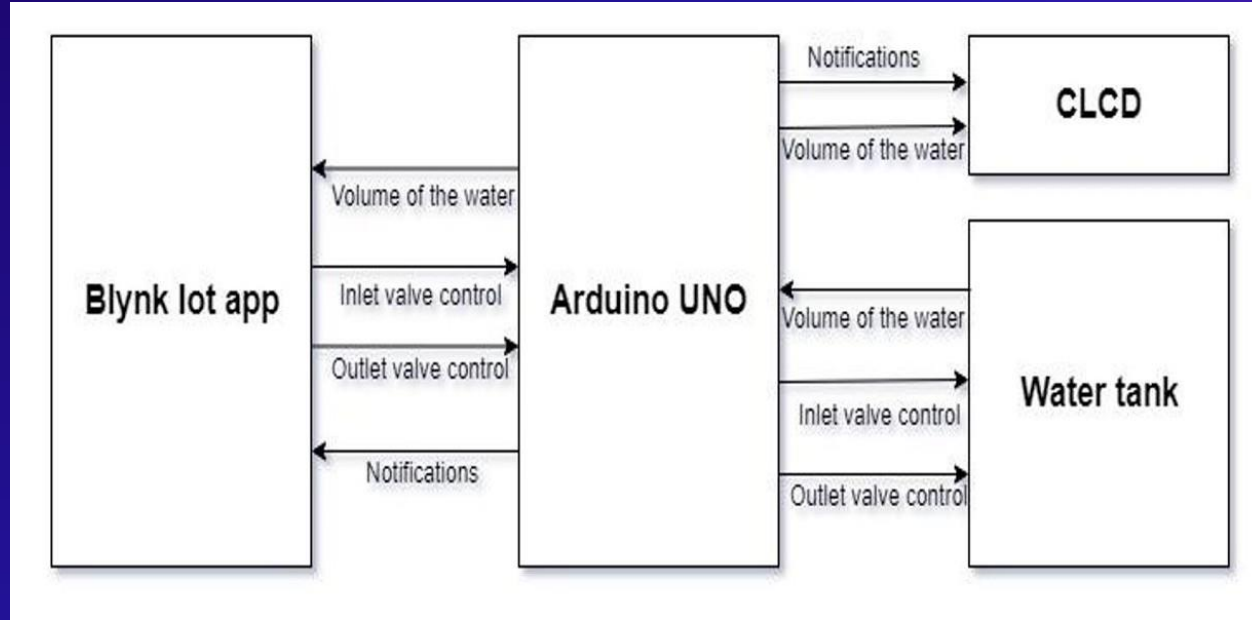
Less sunlight : More Resistance: Less voltage

# TEMPERATURE CONTROL SYSTEM



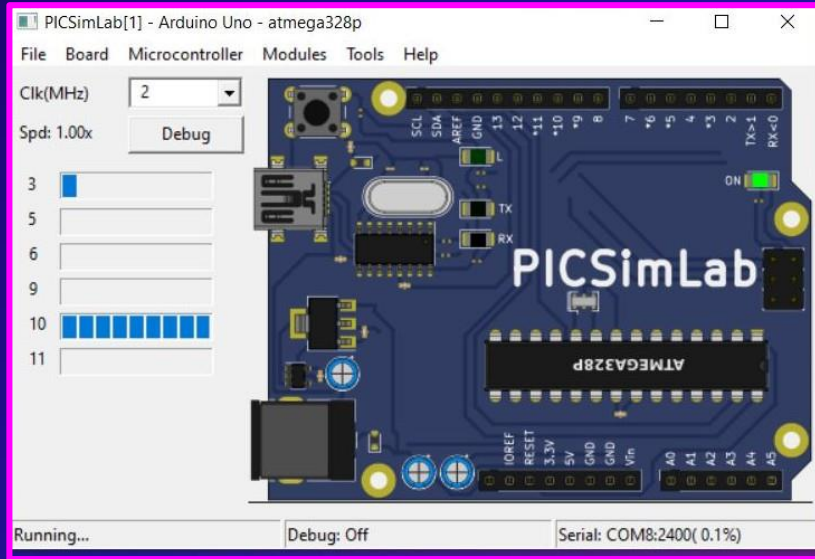
- The temperature control system has a LM35 temperature sensor, heater and a cooler.
- Read the temperature from LM35 temperature sensor and display it on the CLCD.
- Control the heater and cooler using BLYNK APP
- If the temperature is more than 35 turn OFF the heater and send notification to Blynk IoT app and display the same on the CLCD.

# WATER TANK INLET AND OUTLET VALVE CONTROL



- Read the volume of the water in the tank through Serial Communication and display it on the CLCD.
- Control the volume of the water in the tank by controlling the inlet and outlet valve, by sending commands through serial communication.
- Display the volume of water in the tank on the CLCD.

# PICSIMLAB AND BLYNK





# Initial window after loading the program

The image displays a home automation interface on a mobile device (left) and a PC simulation window (right).

**Mobile Interface (Afrith's F62):**

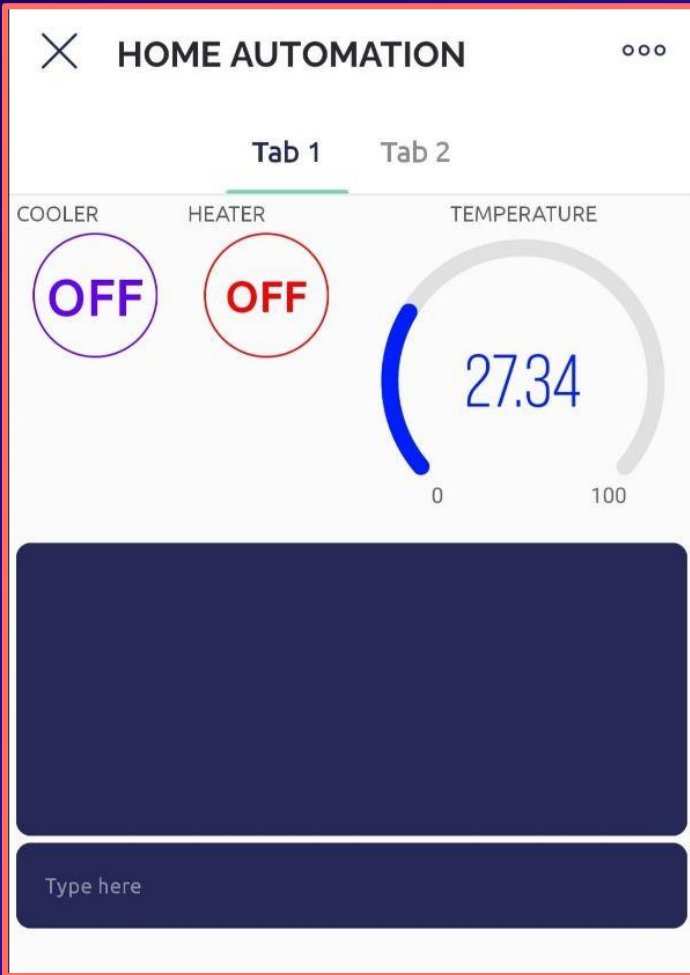
- Time: 9:30, Battery: 75%.
- Section: HOME AUTOMATION.
- Tabs: Tab 1 (selected), Tab 2.
- Controls: COOLER (OFF), HEATER (OFF), TEMPERATURE (27.34).
- Input field: Type here.
- Bottom navigation bar: Home, Search, Add, Settings, etc.

**PC Simulation Window:**

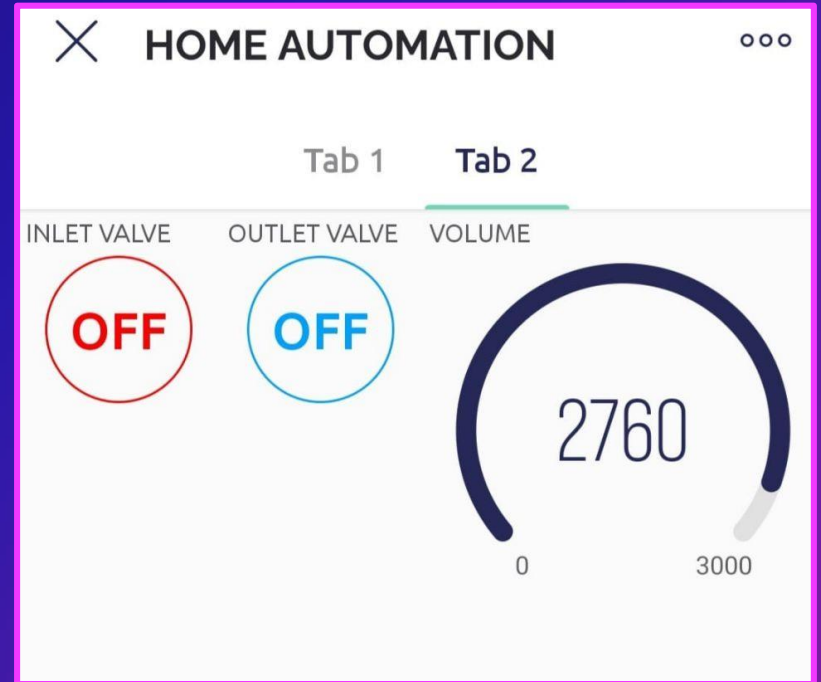
- Hardware components: LDR, W5500, PCF8574, and a fan.
- Temperature display: T=27.34, U=3000.
- Serial Remote Tank window: Serial port: COM9, Disconnect button.
- Scale: 0.8, Offset: 533.82.

**Windows Taskbar:**

- Search: Type here to search.
- System tray: 28°C Mostly cloudy, 09:30, 04-05-2023.



Blynk interface



The screenshot displays the Afritch's F62 development board interface, which is a home automation control panel. The interface is divided into several sections:

- Top Bar:** Shows the device name "Afritch's F62", a battery level indicator at 75%, and a signal strength icon.
- Navigation:** A "HOME AUTOMATION" header with a toggle switch and a "Tab 1" / "Tab 2" selector.
- Control Panel:**
  - COOLER:** A circular gauge with a red needle pointing to 0, labeled "OFF".
  - HEATER:** A circular gauge with a red needle pointing to 0, labeled "OFF".
  - TEMPERATURE:** A circular gauge with a blue needle pointing to 31.25, labeled "31.25".
- Status Message:** A blue box containing the text: "Temperature is above 35 degree celsius. Turning OFF the heater."
- Input Field:** A text input field labeled "Type here".
- Hardware Diagrams:**
  - LDR:** A diagram of an LDR sensor module with pins labeled 1-VCC, 2-GND, 3-AD, 4-PC1/A1, and 5-PC2/A2.
  - W5500:** A diagram of a W5500 Ethernet module with pins labeled 1-VCC, 2-GND, 3-AD, 4-PC1/A1, 5-PC2/A2, 6-RST, 7-SCS, 8-INT, 9-SCLK, 10-MOSI, 11-MISO, 12-SS, 13-SDA, 14-SCL, 15-PC4/A4, 16-PC5/A5, 17-PC6/A6, 18-PC7/A7, 19-PC8/A8, 20-PC9/A9, 21-PC10/A10, 22-PC11/A11, 23-PC12/A12, 24-PC13/A13, 25-PC14/A14, 26-PC15/A15, 27-PC16/A16, 28-PC17/A17, 29-PC18/A18, 30-PC19/A19, 31-PC20/A20, 32-PC21/A21, 33-PC22/A22, 34-PC23/A23, 35-PC24/A24, 36-PC25/A25, 37-PC26/A26, 38-PC27/A27, 39-PC28/A28, 40-PC29/A29, 41-PC30/A30, 42-PC31/A31, 43-PC32/A32, 44-PC33/A33, 45-PC34/A34, 46-PC35/A35, 47-PC36/A36, 48-PC37/A37, 49-PC38/A38, 50-PC39/A39, 51-PC40/A40, 52-PC41/A41, 53-PC42/A42, 54-PC43/A43, 55-PC44/A44, 56-PC45/A45, 57-PC46/A46, 58-PC47/A47, 59-PC48/A48, 60-PC49/A49, 61-PC50/A50, 62-PC51/A51, 63-PC52/A52, 64-PC53/A53, 65-PC54/A54, 66-PC55/A55, 67-PC56/A56, 68-PC57/A57, 69-PC58/A58, 70-PC59/A59, 71-PC60/A60, 72-PC61/A61, 73-PC62/A62, 74-PC63/A63, 75-PC64/A64, 76-PC65/A65, 77-PC66/A66, 78-PC67/A67, 79-PC68/A68, 80-PC69/A69, 81-PC70/A70, 82-PC71/A71, 83-PC72/A72, 84-PC73/A73, 85-PC74/A74, 86-PC75/A75, 87-PC76/A76, 88-PC77/A77, 89-PC78/A78, 90-PC79/A79, 91-PC80/A80, 92-PC81/A81, 93-PC82/A82, 94-PC83/A83, 95-PC84/A84, 96-PC85/A85, 97-PC86/A86, 98-PC87/A87, 99-PC88/A88, 100-PC89/A89, 101-PC90/A90, 102-PC91/A91, 103-PC92/A92, 104-PC93/A93, 105-PC94/A94, 106-PC95/A95, 107-PC96/A96, 108-PC97/A97, 109-PC98/A98, 110-PC99/A99, 111-PC100/A100.
  - PCF8574:** A diagram of a PCF8574 I2C module with pins labeled 1-A0, 2-A1, 3-A2, 4-P0, 5-P1, 6-P2, 7-P3, 8-VSS, 9-P4, 10-P5, 11-P6, 12-P7, 13-VDD, 14-SCL, 15-SDA, 16-VDD, 17-VDD, 18-VDD, 19-VDD, 20-VDD, 21-VDD, 22-VDD, 23-VDD, 24-VDD, 25-VDD, 26-VDD, 27-VDD, 28-VDD, 29-VDD, 30-VDD, 31-VDD, 32-VDD, 33-VDD, 34-VDD, 35-VDD, 36-VDD, 37-VDD, 38-VDD, 39-VDD, 40-VDD, 41-VDD, 42-VDD, 43-VDD, 44-VDD, 45-VDD, 46-VDD, 47-VDD, 48-VDD, 49-VDD, 50-VDD, 51-VDD, 52-VDD, 53-VDD, 54-VDD, 55-VDD, 56-VDD, 57-VDD, 58-VDD, 59-VDD, 60-VDD, 61-VDD, 62-VDD, 63-VDD, 64-VDD, 65-VDD, 66-VDD, 67-VDD, 68-VDD, 69-VDD, 70-VDD, 71-VDD, 72-VDD, 73-VDD, 74-VDD, 75-VDD, 76-VDD, 77-VDD, 78-VDD, 79-VDD, 80-VDD, 81-VDD, 82-VDD, 83-VDD, 84-VDD, 85-VDD, 86-VDD, 87-VDD, 88-VDD, 89-VDD, 90-VDD, 91-VDD, 92-VDD, 93-VDD, 94-VDD, 95-VDD, 96-VDD, 97-VDD, 98-VDD, 99-VDD, 100-VDD.
- Serial Terminal:** A window titled "Serial Remote Tank" showing a serial port connection to COM9. The terminal displays the text "T=35.16HT\_R OFF" and "U=3000".
- Scale and Offset:** A scale bar at the bottom left indicates "Scale: 0.8". A text label at the bottom right indicates "Offset: 533 82".

Offset: 533 82

## Turning ON the cooler :

The image displays a home automation interface on the left and a hardware schematic on the right.

**Home Automation Interface (Afrith's F62):**

- Time: 9:31, Battery: 75%.
- Section: HOME AUTOMATION, Tab 1 selected.
- COOLER: ON (indicated by a purple circle).
- HEATER: OFF (indicated by a red circle).
- TEMPERATURE: 28.32 (indicated by a blue gauge).
- Message: Temperature is above 35 degree celsius. Turning OFF the heater.
- Input field: Type here.
- Bottom bar: III, O, <.

**Hardware Schematic:**

- Top: PD3/~3 NC, NC, NC, NC, NC, NC, NC.
- Left: LDR, 1-VCC +5V, 2-GND, 3-A0 PC1/A1, 4-GND GND.
- Center: W5500, 3-MISO, 4-MOSI, 5-RST, 6-SCL, 7-INT, 8-SCL, 9-SCL.
- Right: 1-VCC +5V, 2-VCC +5V, 3-VCC +5V, 4-VCC +5V, 5-VCC +5V, 6-VCC +5V, 7-VCC +5V, 8-VCC +5V, 9-VCC +5V, 10-VCC +5V, 11-VCC +5V, 12-VCC +5V, 13-VCC +5V, 14-VCC +5V, 15-VCC +5V, 16-VCC +5V.
- Bottom: 1-Heater PD5/~5, 2-Cooler PD4/~4, 3-Temp. PC0/A0, 4-Tach. NC, 5-Vcc 1.2V, 6-Gnd GND.
- Bottom right: JmbLent=27.5C, Temp.=27.50C.

**Serial Remote Tank:**

- File, Help.
- Serial port: COM9, Disconnect.
- Diagram: A blue rectangle with red lines indicating connections.

Scale: 0.8, Offset: 533.82.

# Opening the outlet valve (Outlet Valve - ON)

The screenshot displays a home automation interface for a device named 'Afrith's F62'. The interface is divided into two tabs: 'Tab 1' and 'Tab 2'. Under 'Tab 1', there are three controls: 'INLET VALVE' (OFF), 'OUTLET VALVE' (ON), and a 'VOLUME' knob set to 2600. The background features a detailed circuit board diagram with various components labeled, including an LDR, W5500, and a fan. A 'Serial Remote Tank' window is open on the right, displaying a tank level diagram. The tank is represented by a blue rectangle with a red bar at the bottom, indicating the liquid level. The tank is labeled 'Serial Remote Tank' and has a 'Serial port' dropdown set to 'COM9' and a 'Disconnect' button. The tank level is shown as a blue bar with a red bar at the bottom, indicating the liquid level. The tank is labeled 'Serial Remote Tank' and has a 'Serial port' dropdown set to 'COM9' and a 'Disconnect' button. The tank level is shown as a blue bar with a red bar at the bottom, indicating the liquid level.

HOME AUTOMATION

Tab 1 Tab 2

INLET VALVE OFF OUTLET VALVE ON VOLUME 2600

1-Heater P05/-5  
2-Cooler P04/4  
3-Temp. PC0/A0  
4-Tech. MC  
5-Vcc 1.2V  
6-Gnd GND

1-Vcc +5V  
2-D0 MC  
3-A0 PC1/A1  
4-GND GND

1-Vcc GND  
2-A1 MC  
3-A2 MC  
4-P0 110  
5-P1 111  
6-P2 112  
7-P3 113  
8-VSS GND  
9-P4 114  
10-P5 115  
11-P6 116  
12-P7 117  
13-/INT 118  
14-SCL PC3/A5  
15-SDA PC4/A4  
16-MOD /V

Serial Remote Tank

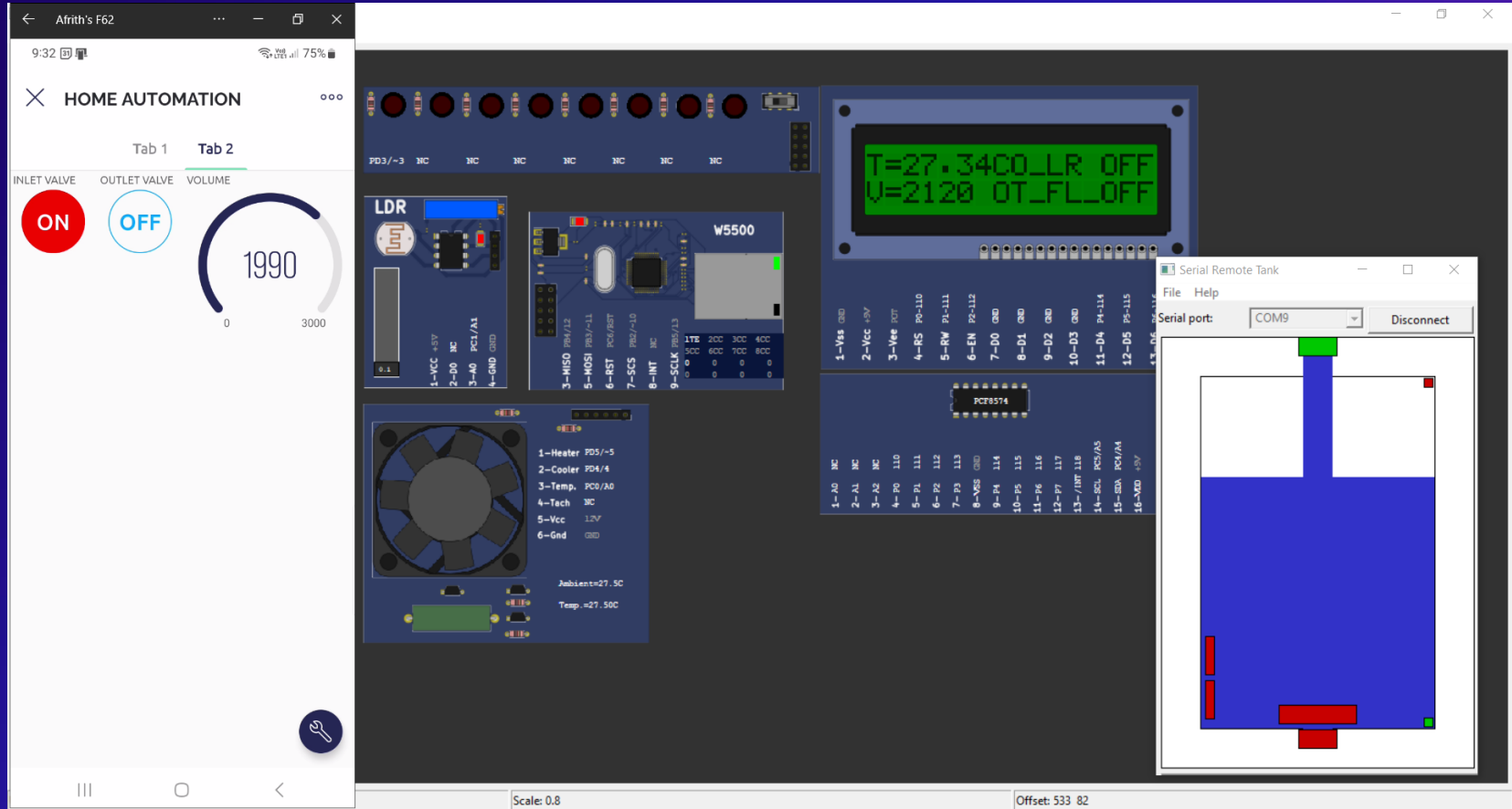
File Help

Serial port: COM9 Disconnect

T=27.34CQ\_LR OFF  
U=2470 OT\_FL\_ON

Scale: 0.8 Offset: 533.82

Outlet valve is closed when volume of tank is less than 2000 litres. (Inlet Valve - ON)



# PROJECT DEMO



This project aims control the lights based on availability of sunlight, temperature of the home, inflow and outflow of water in the water tank using Blynk application.

# THANK YOU

