Universidad Autónoma de Guadalajara

Software Engineering

IoT app project

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Subject: IoT with Microprocessor

Group: IDS 10010

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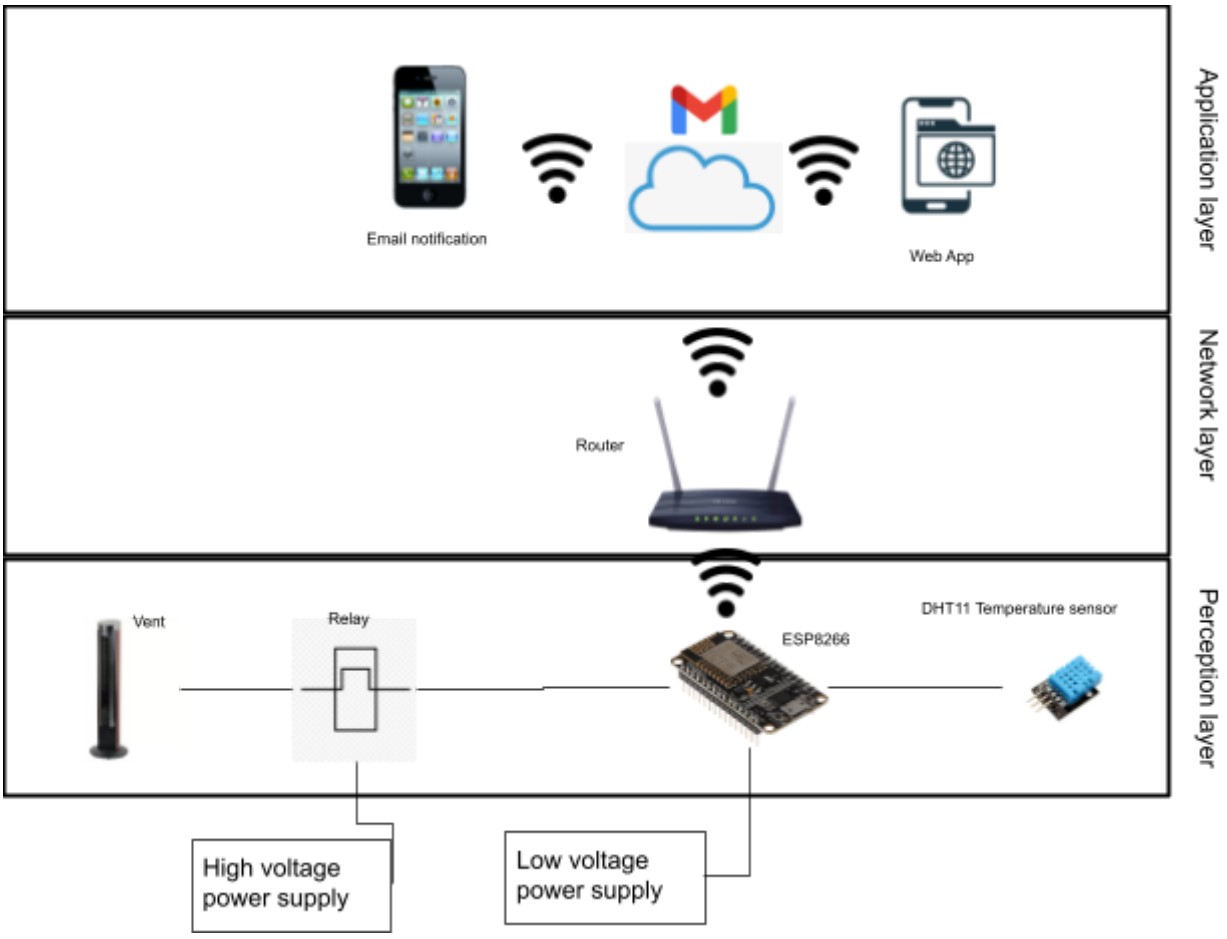
Temperature monitor for vents

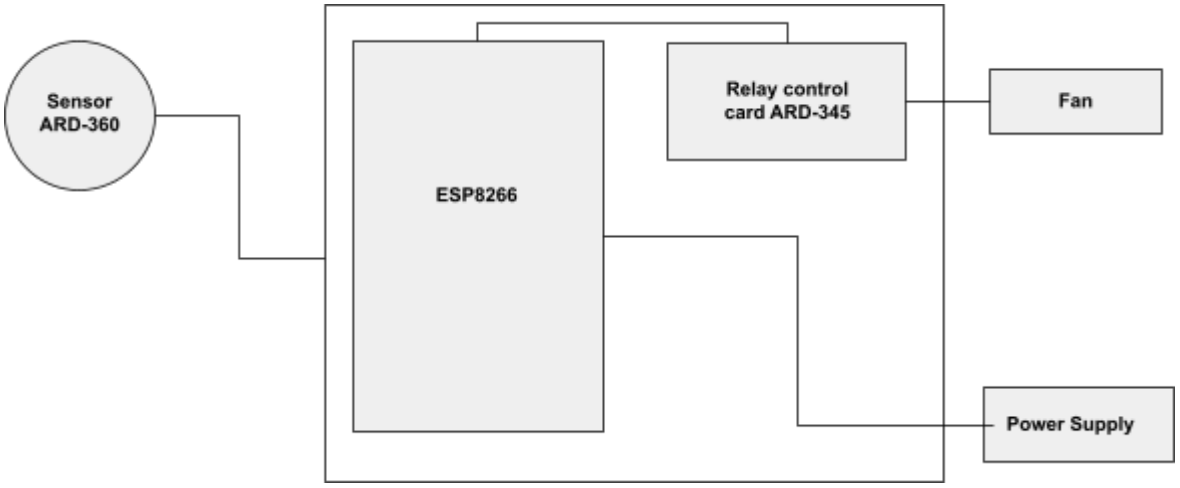
In this project, we plan to develop a monitoring system for vents, which is going to be controlled by the ESP8266. The vent will turn on when the sensor perceives a certain temperature and the ESP8266 will send a notification to a given email address to let the user know that the vent is turned on.

This will be achieved by letting the relay administrate the pass of the energy that the vent needs. When the sensor notifies the ESP8266 module that the temperature is over the established limit, it will send an electric signal to the relay, making it know if the vent must be turned on or off. In case the vent went ON after the ESP8266 processed the data an email will be sent via Wifi connection and an SMTP server directly to the user's email.

Is important to mention that the user will be also able to set the temperature limit on a webpage, see the fan status, and turn ON or OFF the fan manually.



Block diagram



List of components

Component	Description

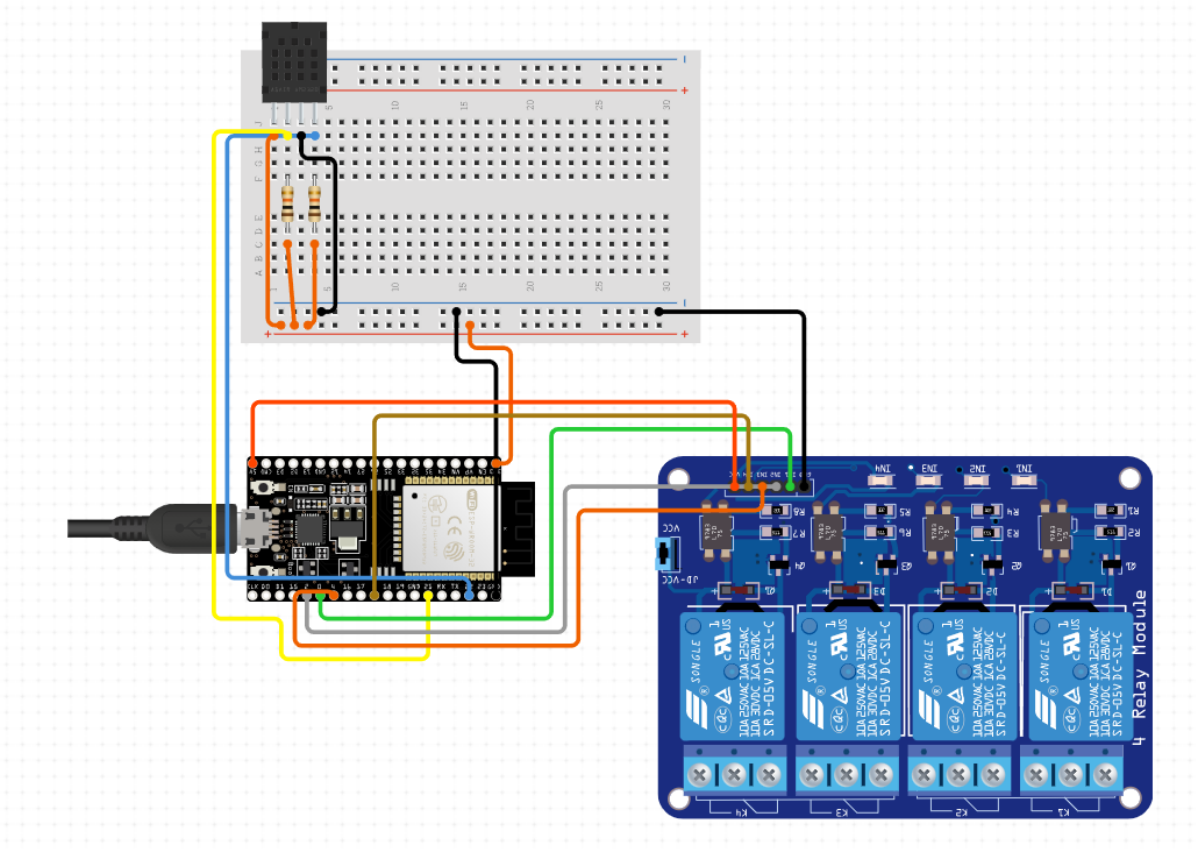
ESP8266	• Model: ESP8266-01 Wifi Module
	• Characteristics:
	  ○ Version 1 generation 2
	  ○ Chip type: CP2102
	  ○ Chip working voltage: 3.3 Vdc
	  ○ Wi-Fi 2.4 GHz 802.11 b / g
	  ○ Integrated TCP / IP protocols
	  ○ Supports WPA / WPA2
	  ○ 13 digital pins
	  ○ 1 analog pin
	  ○ 3-pin 3.3 Vdc
	  ○ 1 Vin pin
	  ○ 4 pins GND
	  ○ 32-bit MCU
	  ○ Micro USB port

Relay control card ARD-345	• Model: ARD-345
	• Characteristics:
	  ○ Control up to 4 relays
	  ○ Each one has 1 open, 1 closed, and 1 common contact
	  ○ Each relay supports up to 10 A at 250 V ~ maximum
	  ○ They incorporate LEDs to identify if they are activated or deactivated

Temperature and humidity sensor	• Model: ARD-360 • Characteristics:

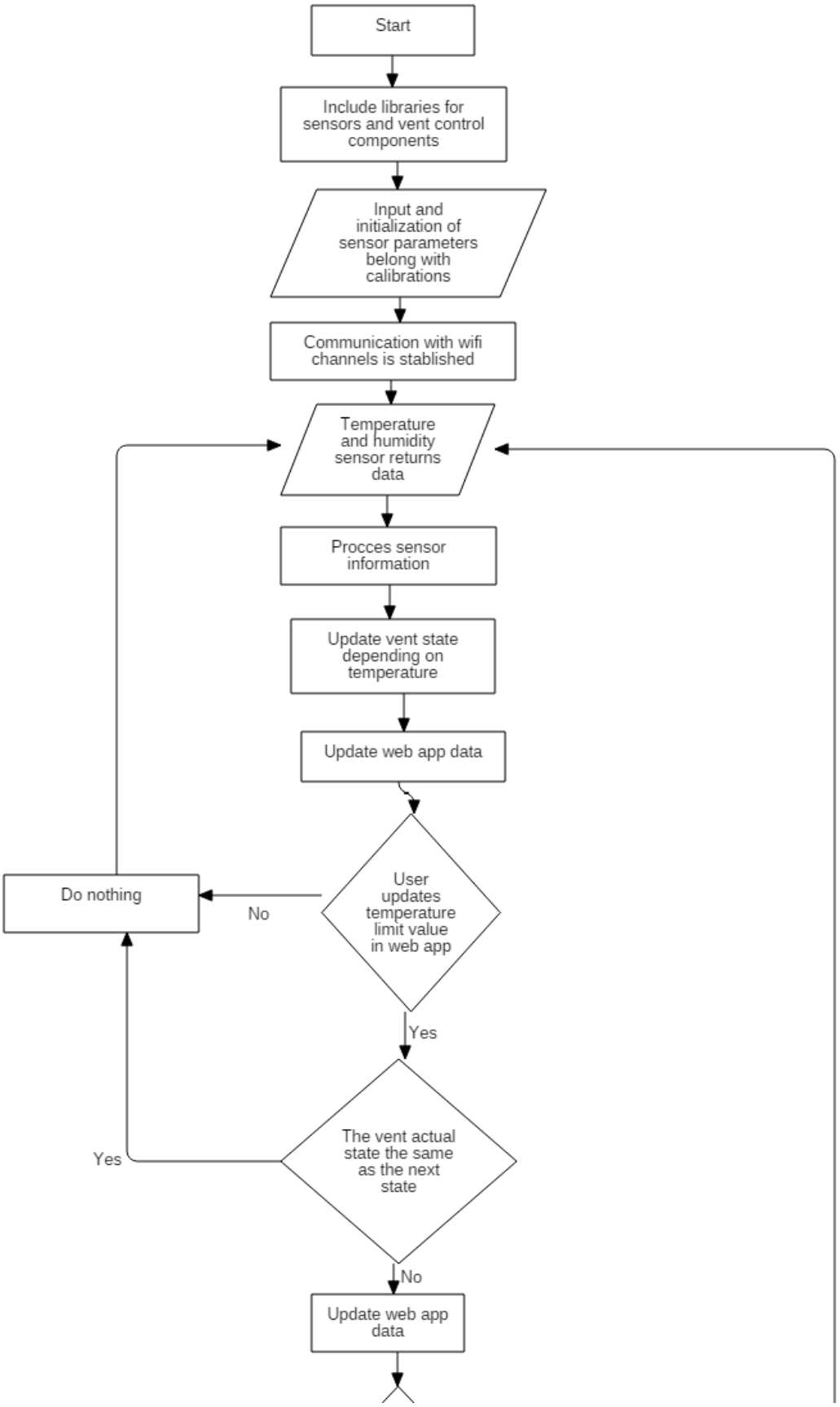
ARD-360	○ Power supply: 3.3 to 5.5 Vdc ○ Humidity range: 20 to 90% RH ○ Temperature range: 0 to 50 ° C ○ Humidity resolution: 1% RH ○ Temperature resolution: 1 ° C ○ Humidity tolerance: +/- 5% RH ○ Temperature tolerance: +/- 2 ° C
Fan	● Model: Floor fan Lasko Cyclone ● Characteristics: ○ Aerodynamic blade and swirling grill design combine for power and performance matched only by a Cyclone itself. ○ Three whisper-quiet- high-performance speeds ○ Adjustable fan head pivots and locks in place for precision comfort ○ Lightweight with easy-carry handle for convenient portability ○ ETL listed. Patented fused safety plug. ○ Aerodynamic blade and swirling grill design combine for power and performance matched only by a Cyclone itself. ○ Three whisper-quiet- high-performance speeds

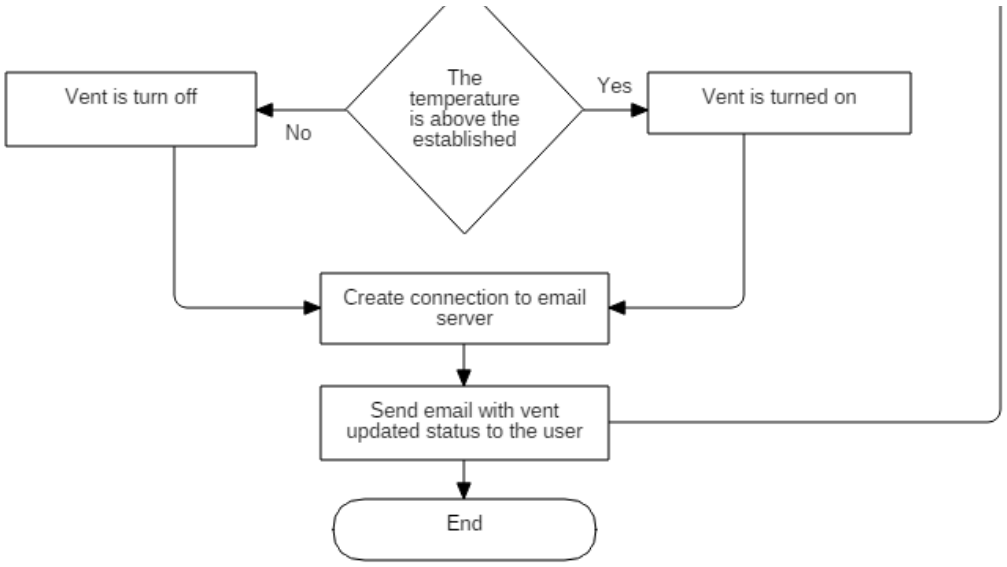
Schematic diagram



https://www.circuito.io/app?components=513,360217,442979,656839

Algorithm


Start
Include libraries for sensors and vent control components
Input and initialization of sensor parameters belong with calibrations
Communication with wifi channels is stablished
Temperature and humidity sensor returns data
Procces sensor information
Update vent state depending on temperature
Update web app data
User updates temperature limit value in web app
No
Do nothing
Yes
The vent actual state the same as the next state
Yes
No
Update web app data


The temperature is above the established
Yes
No
Vent is turned on
Vent is turn off
Create connection to email server
Send email with vent updated status to the user
End