Humidity Temperature Controlled House

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Overview

- Design Purpose
- Equipment List
- Sensors
- How the System Works
- Circuit Diagram
- Program Code
- Cost
- Future Improvements
- Conclusion

Design Purpose

- Create a comfortable, controlled environment
- Help people with medical conditions which require certain temperatures and humidity levels
- Control temperature and humidity of different rooms in one house separately

Equipment List

- Foam
- Basic Stamp Version 2
- Board of Education
- Light Emitting Diode (LED)
- Two buttons
- Humidity/Temperature Sensor
- Three water pumps
- IRF 510 Transistors
- IN4001 Diodes
- High Resistance Wire
- Servo Motor
- PCV Piping
- 12 VDC Fan
- 24 Gauge Bus Wire- Uninsulated tinned-copper

Sensor

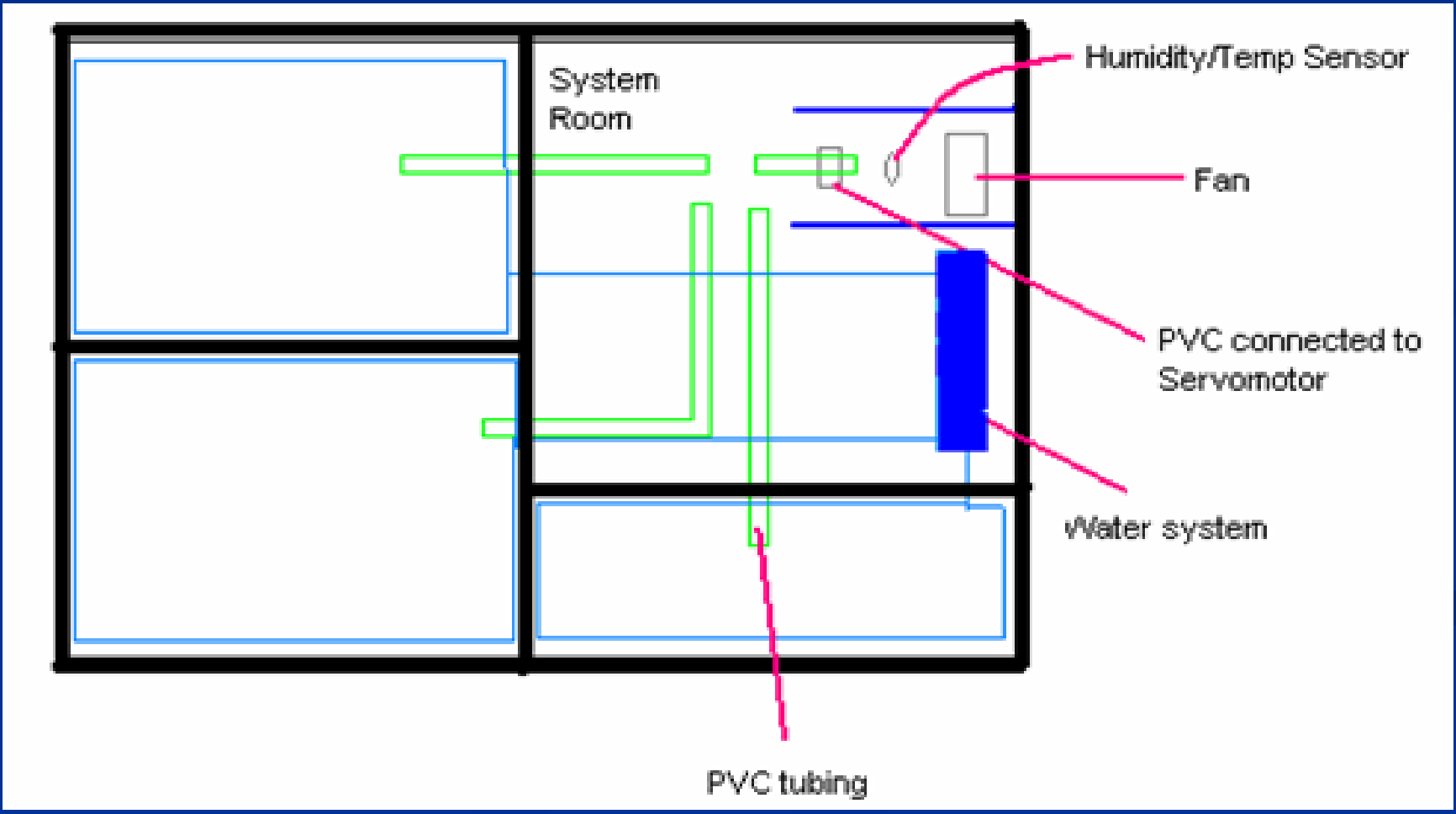
- Sensirion Temp/Humidity Sensor (SHT11)
- The features include:
  - ✓ A temp. range from -40ºC to +123.8ºC
  - ✓ Temp. accuracy ±0.5ºC at 25ºC
  - ✓ Humidity range from 0 to 100% RH
  - ✓ Absolute RH accuracy of ±3.5% RH
  - ✓ Low Power Consumption (typically 30µW)

How the System Works - I

- The system is placed in one of the four rooms
- A fan is mounted onto a wall venting outside of the house
- A section of the PVC tubing is attached to a servomotor which will turn the tubing in specific positions
- Tubing is routed through the other rooms which will connect back to the room with the system
- By rotating the servomotor, the system will draw air from each room (separately) via the fan and sample air

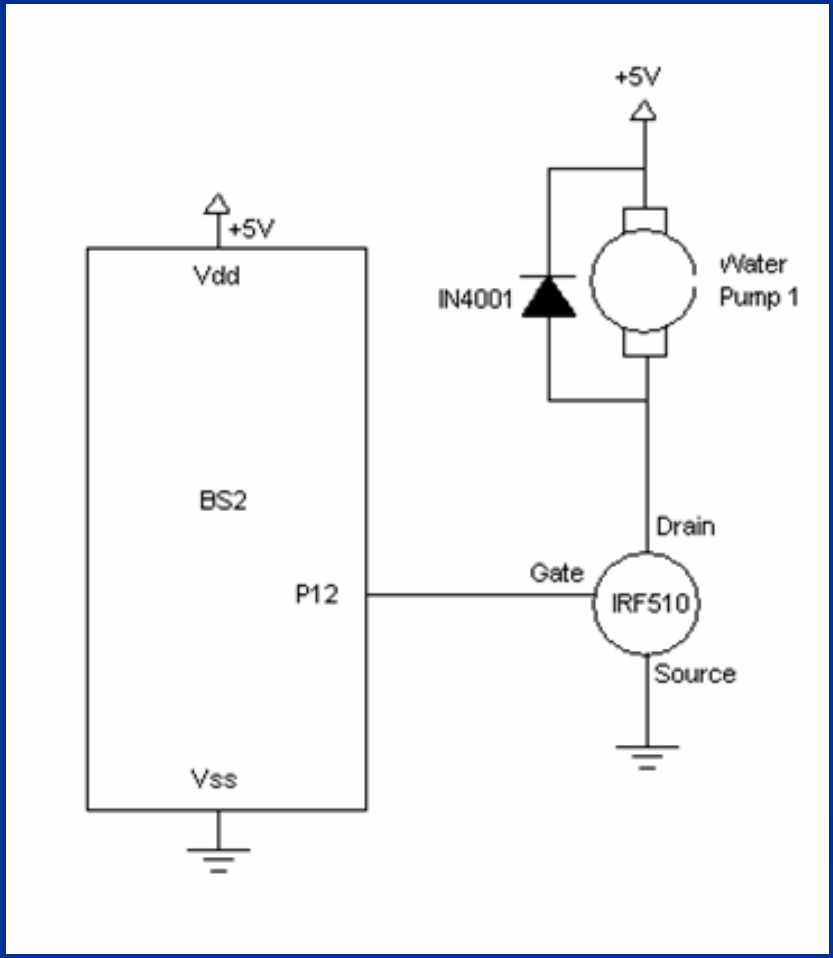
How the System Works - II

Diagram

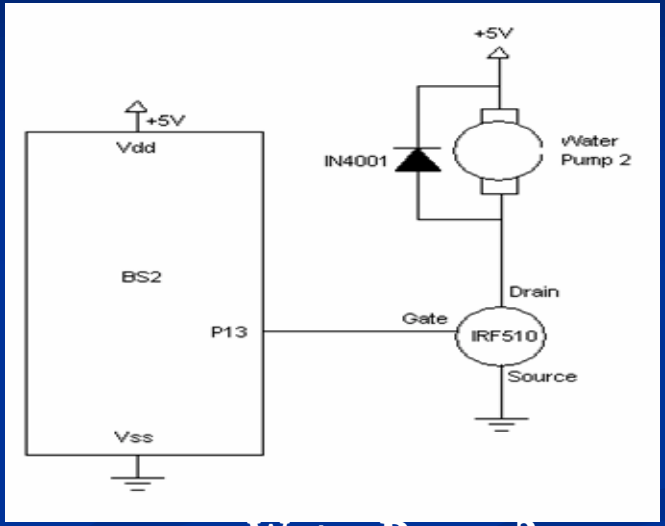


Circuit Diagram - I

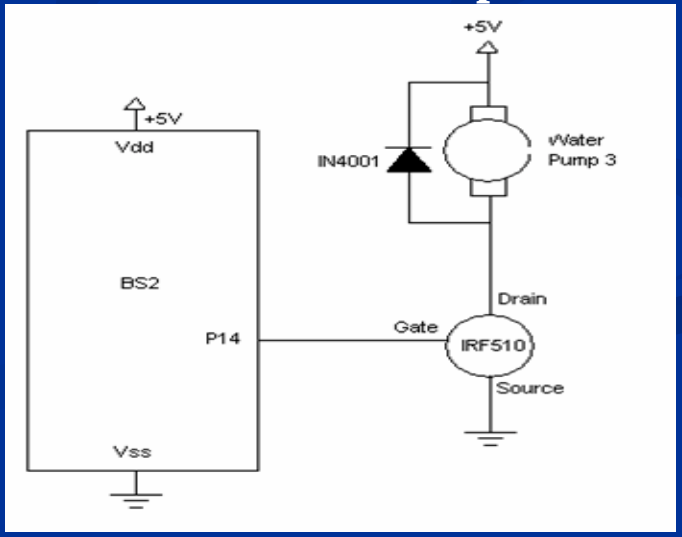
Water Pump 1



Water Pump 2

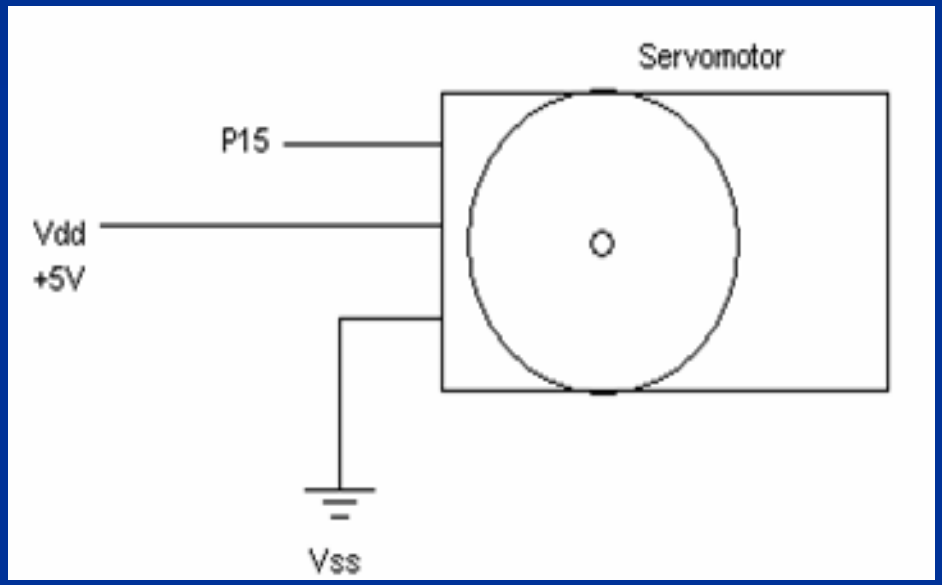


Water Pump 3

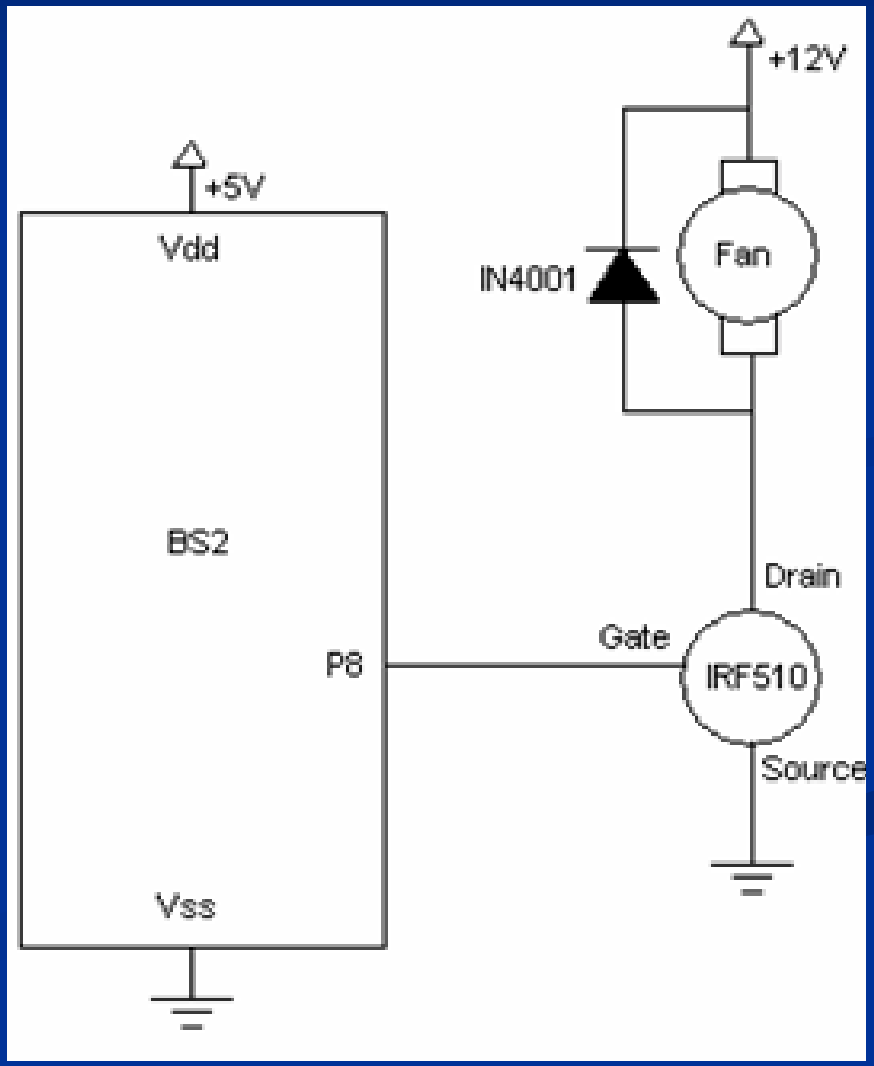


Circuit Diagram - II

Servomotor

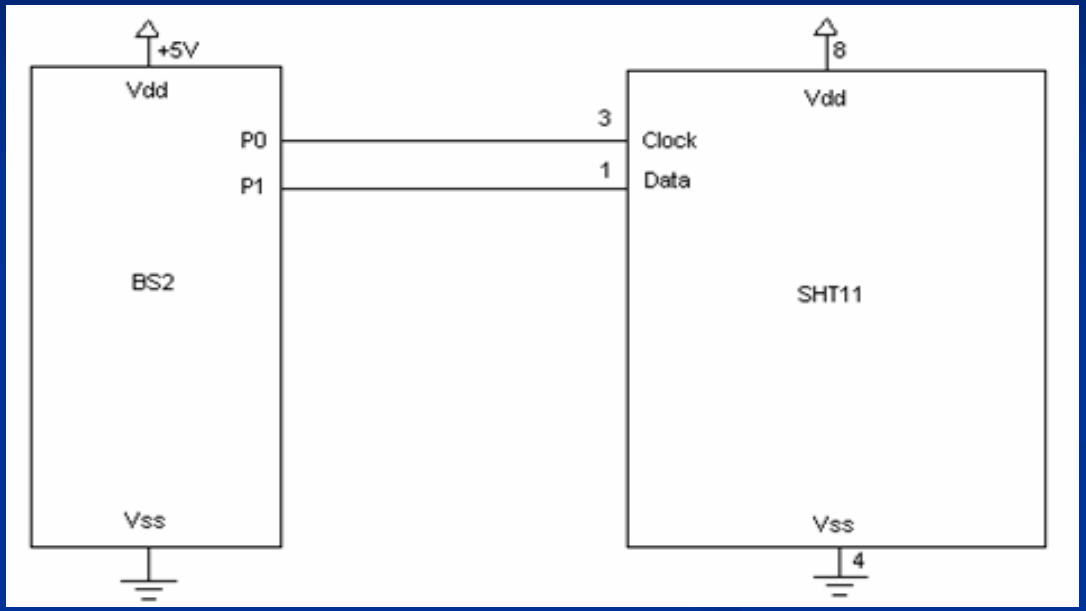


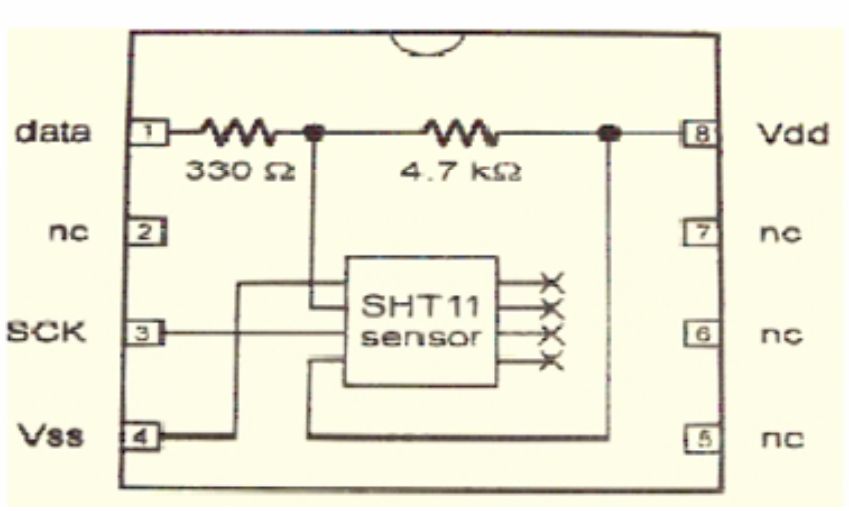
Fan



Circuit Diagram - III

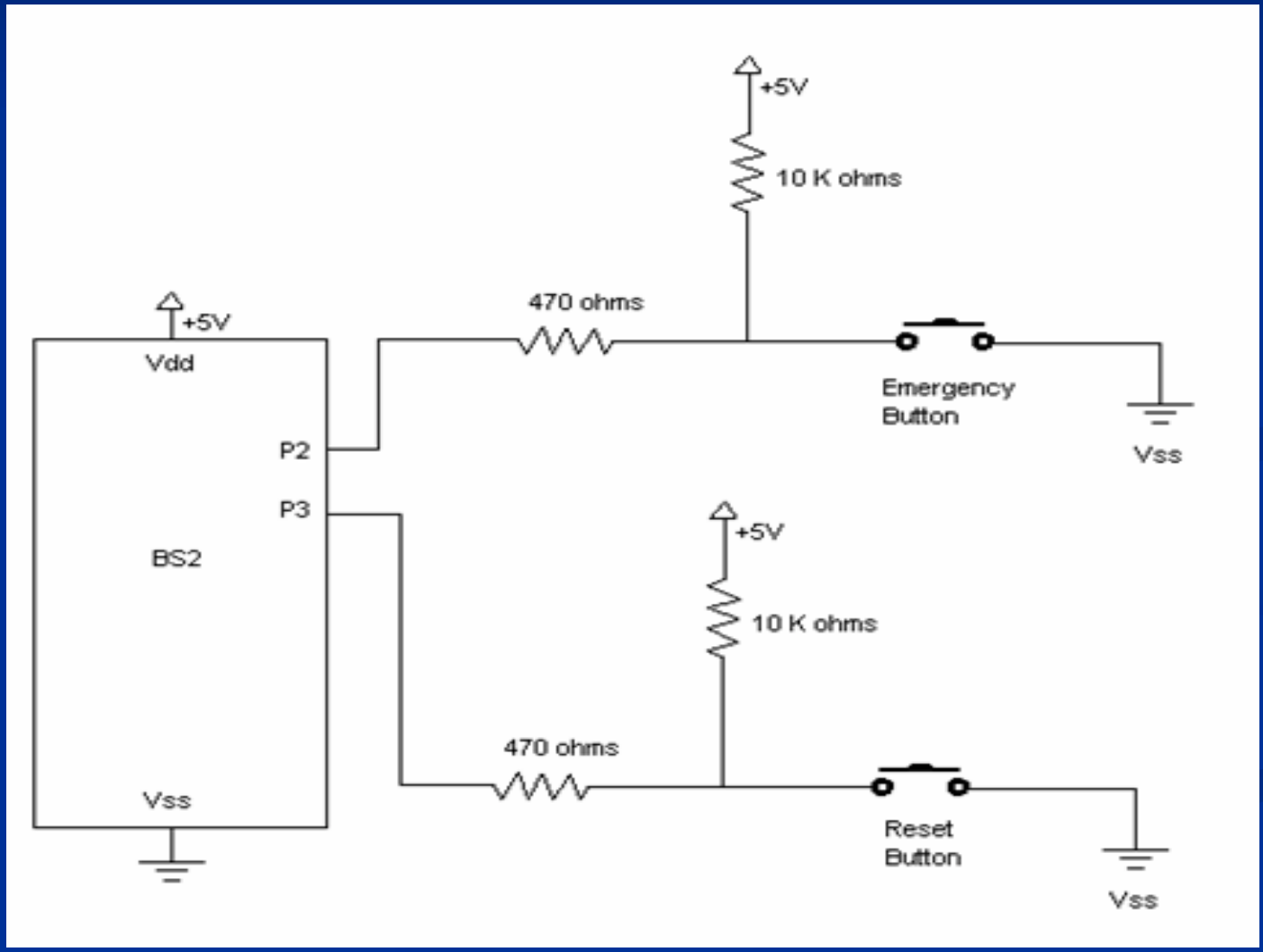
Sensirion SHT 11 Temp / Humidity Sensor





Circuit Diagram - IV

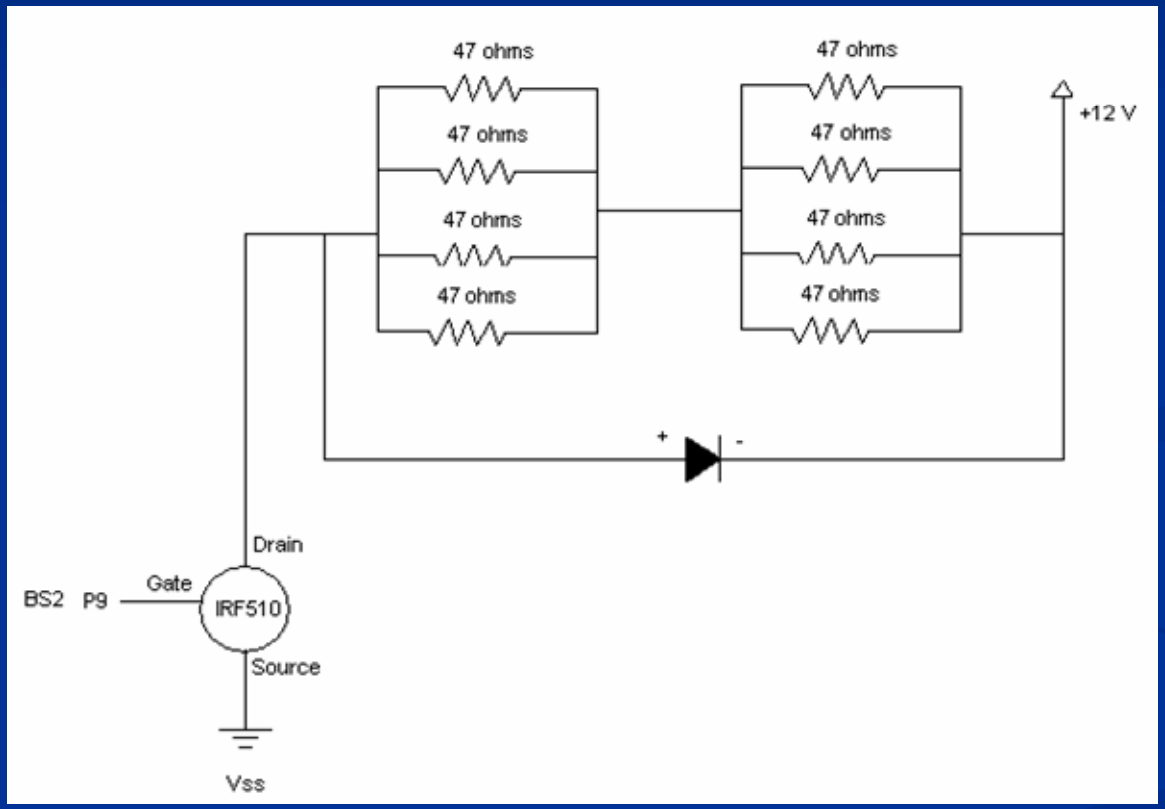
Emergeny and Reset Buttons



Circuit Diagram - V

Heating

Room 1



Heater for room 2 and 3 are similar except that Pins 10 and 11 were used on the BS2

Program Code

Cost

BS2, Board of Education, etc.	$130.00
Plexiglass (30” x 36”)	$11.92
½” PVC tubing 20 ft.	$2.80
IN4001 Diode x 7	$4.49
IRF-510 MOSFET Transistor x 7	$15.13
Foam	$15.62
Tape	$2.38
L-fittings for PVC x 5	$1.03
Fan x 2	$23.88
Water Pump x 2	$25.00
Sensirion SHT11 Temp/Humidity Sensor	$32.59
24 Gauge Bus Wire	$2.16
Total	$267.00

Future Improvements

- Creating better connections at joints in ducting system
- Making the system more efficient (ie: one water pump)
- Humidifier/spray nozzles
- Incorporate other various systems such as:
  - Carbon Monoxide detector system
  - Smoke/fire detector system
  - Home Security system
  - Cooling system
  - Dehumidifier

Conclusion

- Prototype was successful
- Can be applied elsewhere (ie: tropical plants)