Temperature Controlled Fan using Arduino and 12V DC fan

Team:

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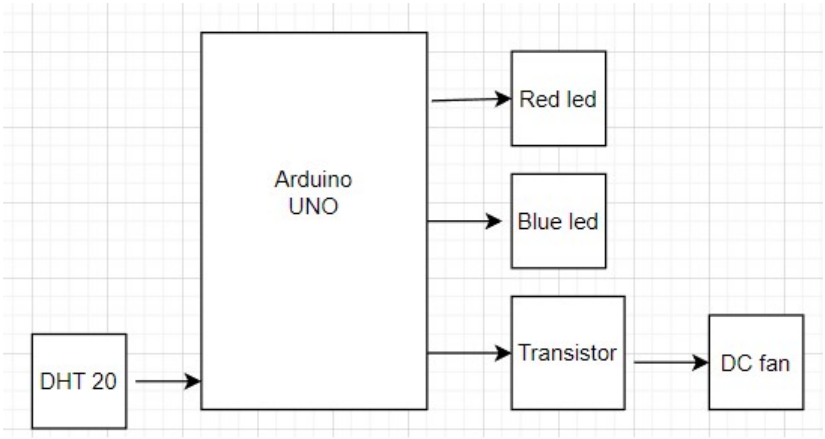
Objectives:

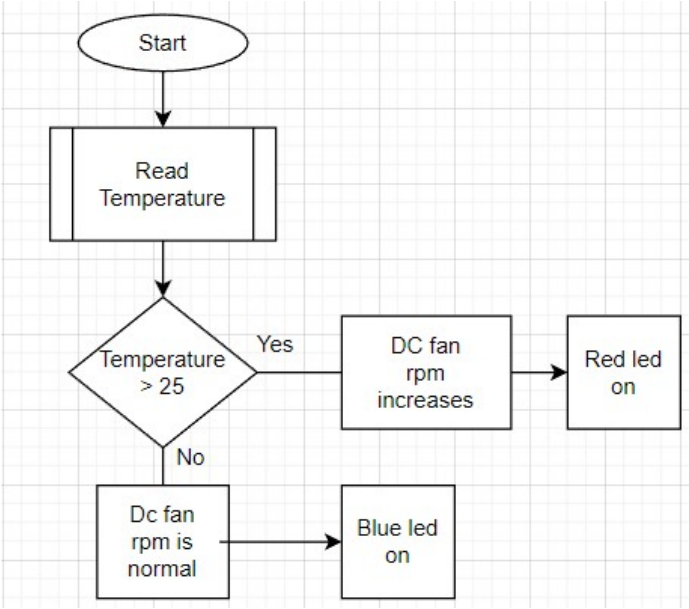
- To design an effective temperature-controlled fan system.
- To develop this project at a reasonable cost.
- To evaluate the performance of the developed project.
- To validate the cost effectiveness and performance of this project such that it is availability ranges from small-grade applications to large-scale applications.

Design Solution:

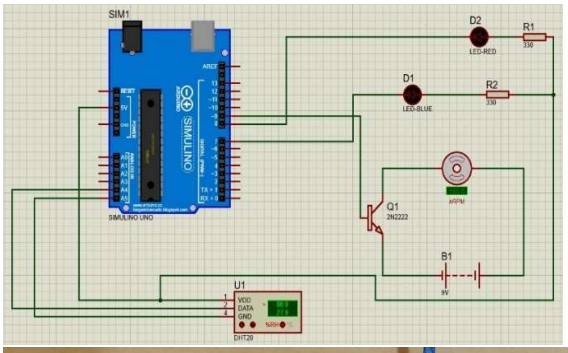
- Working Principle:

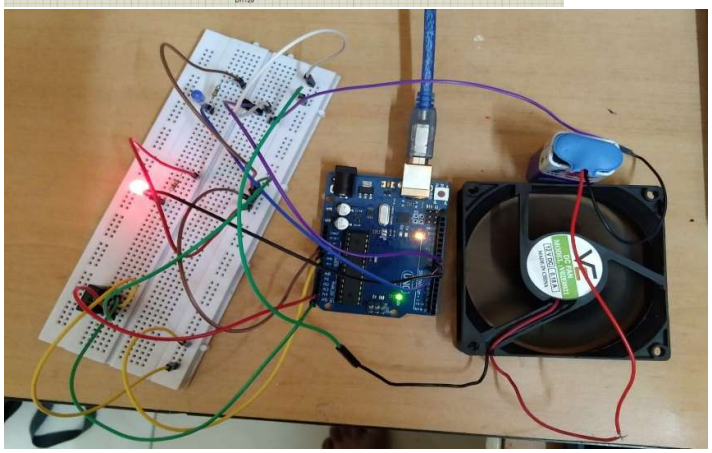


- Circuit Diagram: The temperature is read by the DHT 22 sensor and is given as an analog input to the Arduino uno through A4 (SDA)and A5 (SCL)pins. The Arduino reads the input and responds accordingly by switching on the red/blue led along with adjusting the rpm speed of the 12V DC Fan. A 2n2222 NPN transistor is used along with a 9V battery to power the DC Fan. The temperature readings can be read serially.
- Programming:



- Results:





- Conclusion: The temperature-controlled dc fan system developed successfully reads the temperature of its surroundings and adjusts the fan rpm accordingly. To show the practical application of this project, room temperature is considered.

Limitations of the project and scope for improvements: Although this project was developed to successfully show the variation of the temperature of the environment before and after the DC fan rpm increases, we have no method to show for it. In the future we can try to analyse the

temperature change in the environment to truly determine the working applications of our project.

Justification as per the problem statement: Many electronic components work by transmitting and receiving pulses which may malfunction if the device's temperature abruptly increases. It can also lead to severe safety issues. Our developed project is a cooling and heat sink system that can help keep the components cool and avert the unneeded and dangerous situations. Our project can range from small scale applications to large scale applications simply by increasing the no. of fans required.

Team comments: While working on this project we learned how to use the various libraries of Arduino, learned how to interface DHT20 sensor with Arduino and applications of PWM in controlling the speed of DC fan by varying voltage. This project being our first experience with Arduino we learnt how to interface Arduino with different components.

Bill of materials:

Sl. No	Component list	Cost per unit	Quantity	Total (Rs)
1	Arduino Uno	900	1	900
2	DHT 20	119	1	119
3	Resistors (330 ohm)	2	2	4
4	Breadboard + Jumper wires	200		200
5	LEDs	6	2	12
6	Battery and battery caps	28	1	28
7	2n2222 transistor	10	1	10
8	12V DC Fan	115	1	115