E3Sem2 Mini Project-2

IMPLEMENTATION OF TEMPERATURE BASED FAN SPEED CONTROLLER Using Arduino

Under the Guidance of :-

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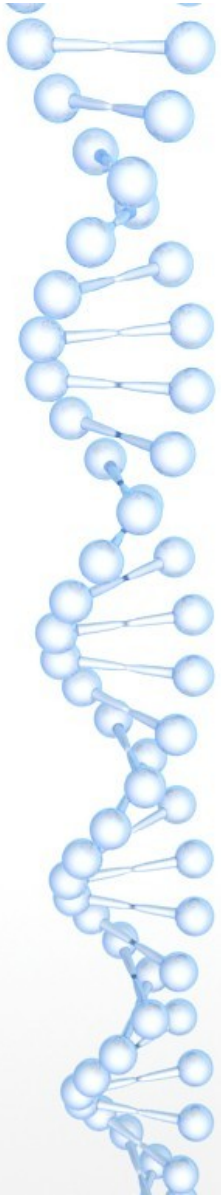
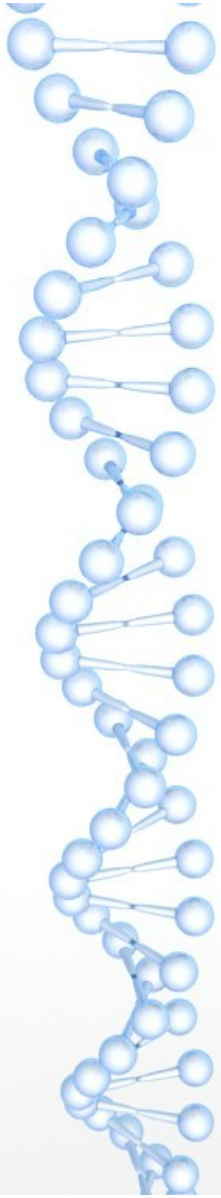


CONTENTS

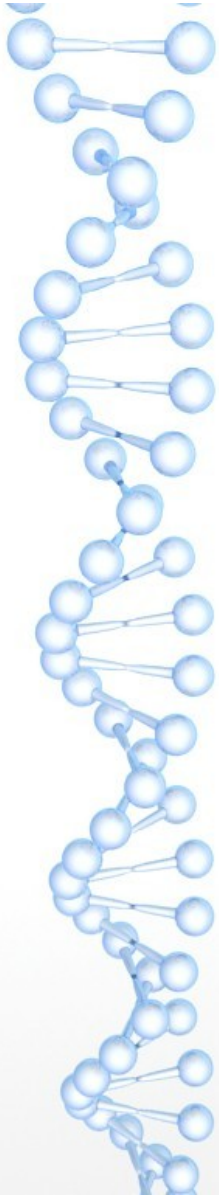
- Introduction
- Required components
- Component details
- Circuit diagram
- Applications
- Advantages
- Conclusion

Introduction

- In Generally, during hot summer days the temperature around us raises to extreme high or extreme low in winter conditions and we use a regulator manually to control the fan speed to maintain a balanced temperature in room.
- To make it more convenient and efficent, we are introducing a smart fan speed controller based on temperature sensor using arduino.



- This works in sensing the temperature around our surroundings(or Room),based on the temperature , the fan speed Regulates Automatically.
- To Control the fan speed automatically ,we have implemented a circuit using LM35 Temperature sensor and Arduino(UNO) board.



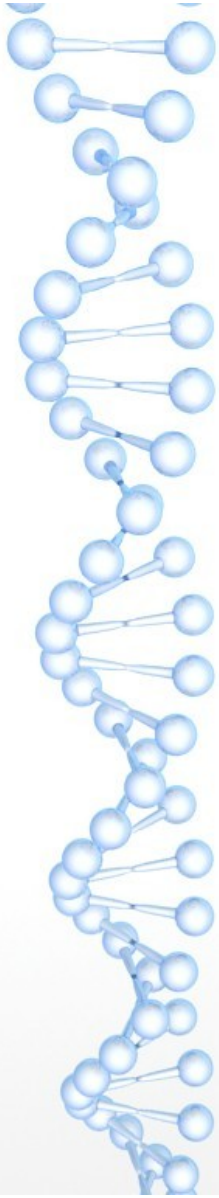
Required Components

- Arduino UNO(At mega328p Microcontroller)
- LM35 Temperature sensor
- Transistor(BJT)
- Fan (12V DC)
- LCD Display
- LED bulb

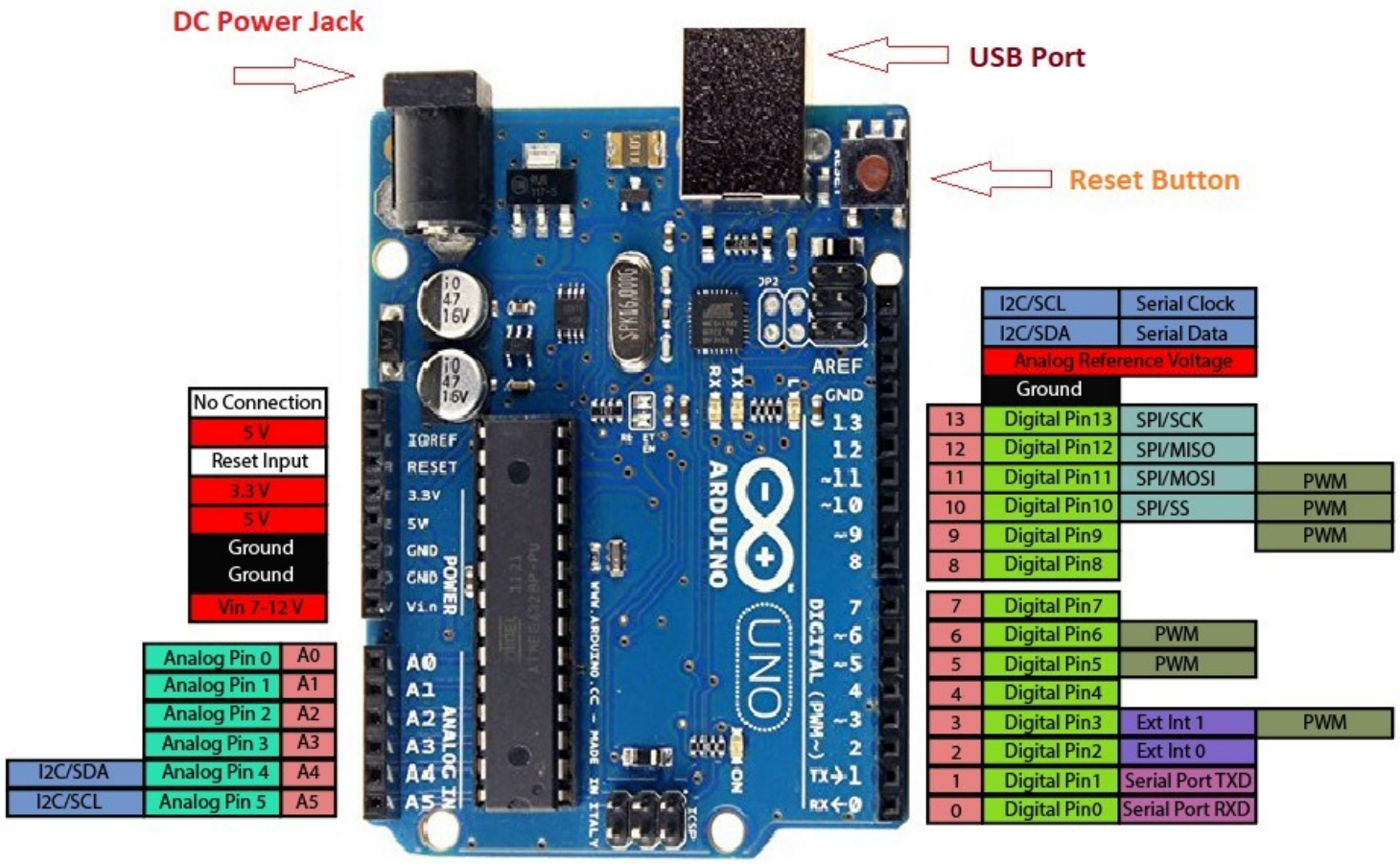
Components Details

Arduino:-

- Arduino UNO is a programmable-hardware equipment used for various Electronic Projects and a Easy to use Hardware and software.
- Arduino consists of both a **physical programmable circuit board (often referred to as a microcontroller) and a piece of software**, or IDE (Integrated Development Environment) that runs on your computer, used to write and upload computer code to the physical board.



- Arduino Uno Contains ATMega 328p microcontroller itself.
- **Input:** LM35 sensor temperature readings to arduino , Finger on Button
- **Output:** LED bulb, 12 DC FAN Motor



Arduino Uno Pinout

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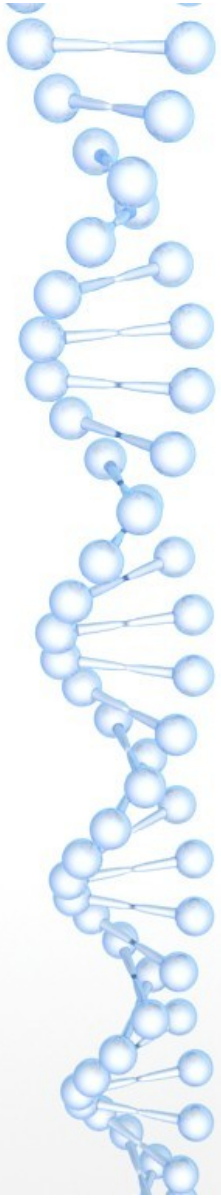

LM35 Temperature sensor

- LM35 is a temperature measuring device having an analog output voltage proportional to the temperature.
- It provides output voltage in Centigrade (Celsius).
- It is low self heating and its Linear Scale Factor is + 10-mV/°C.

- Operating temperature range: −55°C to 150°C Range
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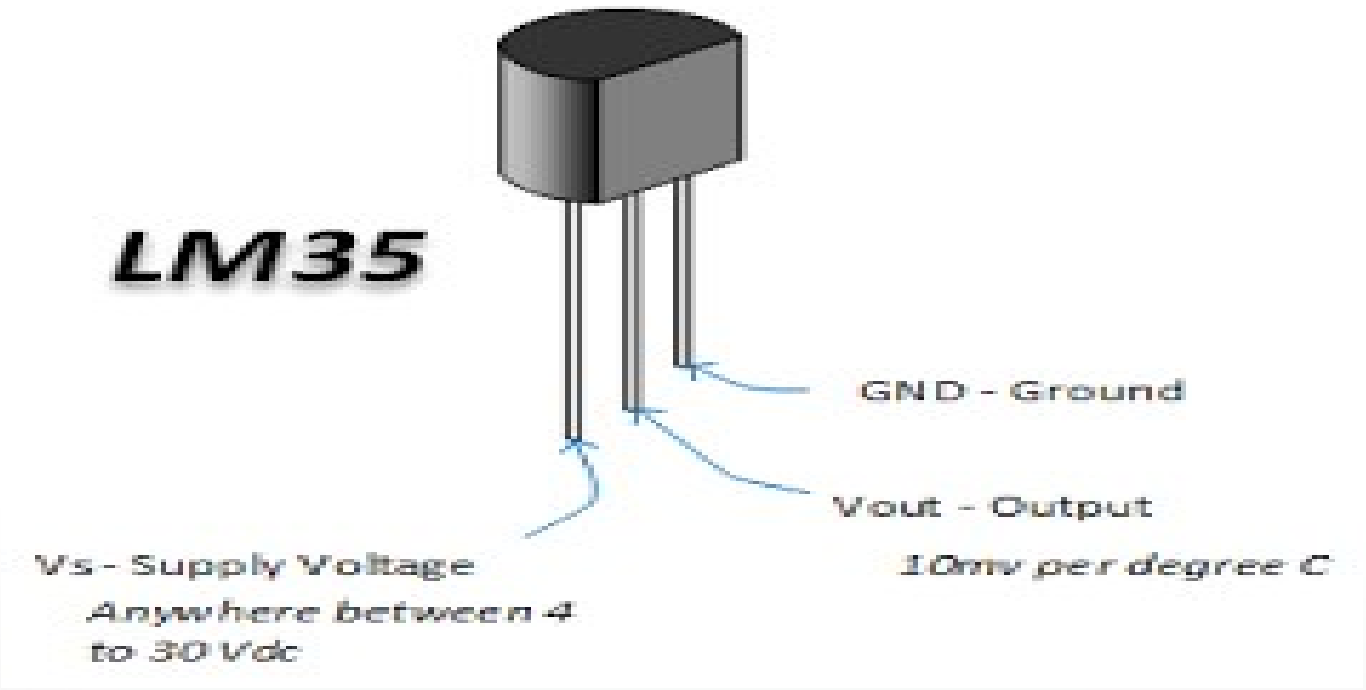
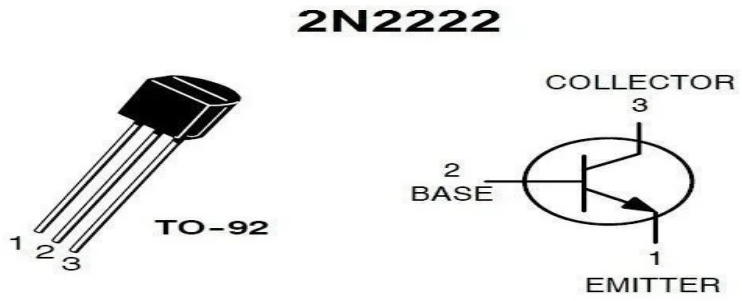


BJT Transistor

- The is a common NPN bipolar junction transistor (BJT) used for general purpose **low-power amplifying or switching applications.**

- It is designed for low to medium current, low power, medium voltage, and can operate at moderately high speeds.

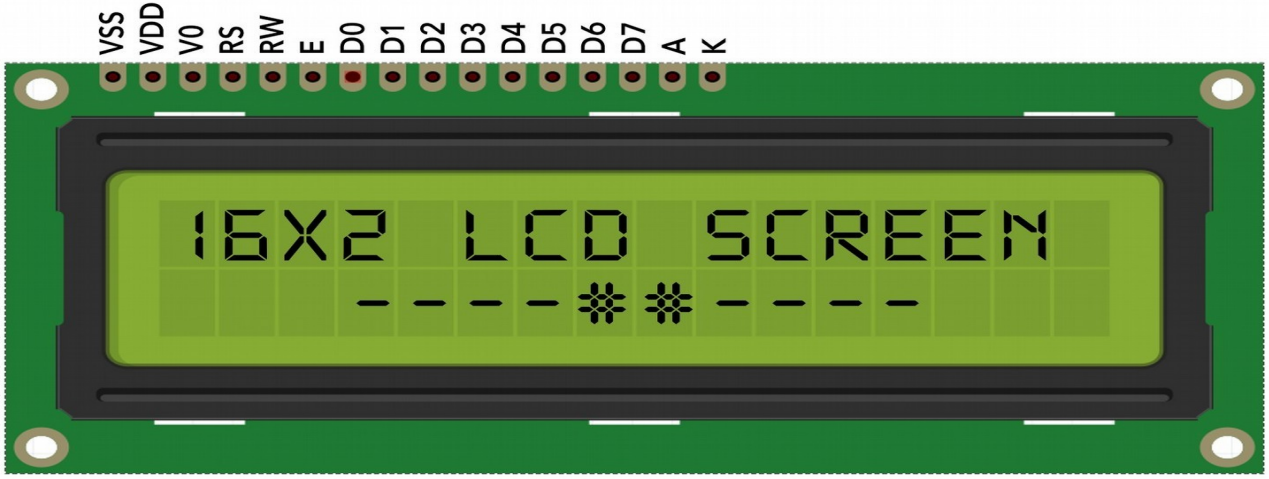


Fan (12v DC)

- DC axial fans are widely used across industries for cooling electrical machines and equipment.
- Its Operating temperature range is: -10c to 70 celcius

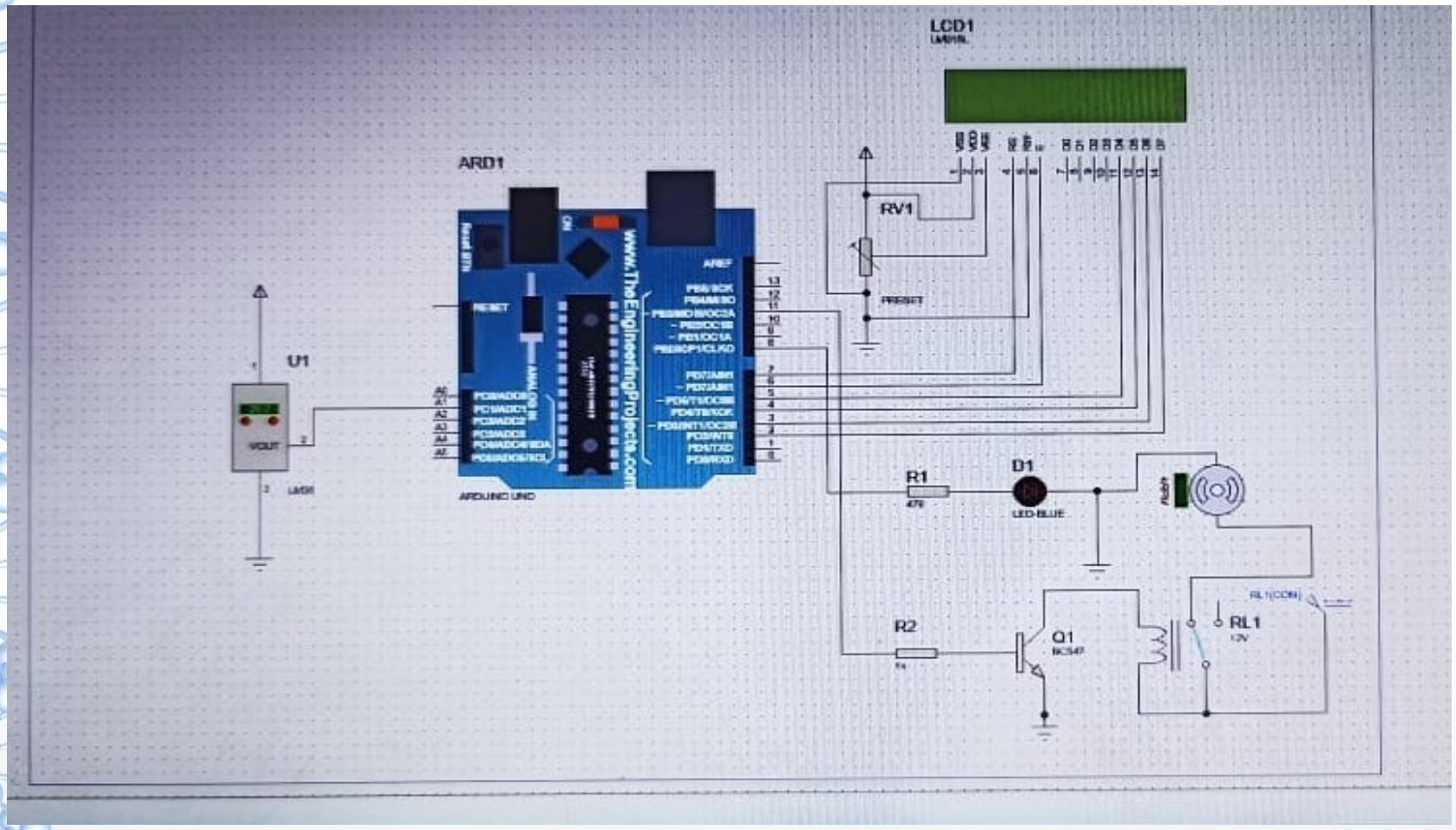
LCD(16x2)

- Liquid crystal Display(LCD) usually displays an Image by using the Liquid crystals
- A 16x2 LCD means it can display 16 characters per line and there are 2 such lines.

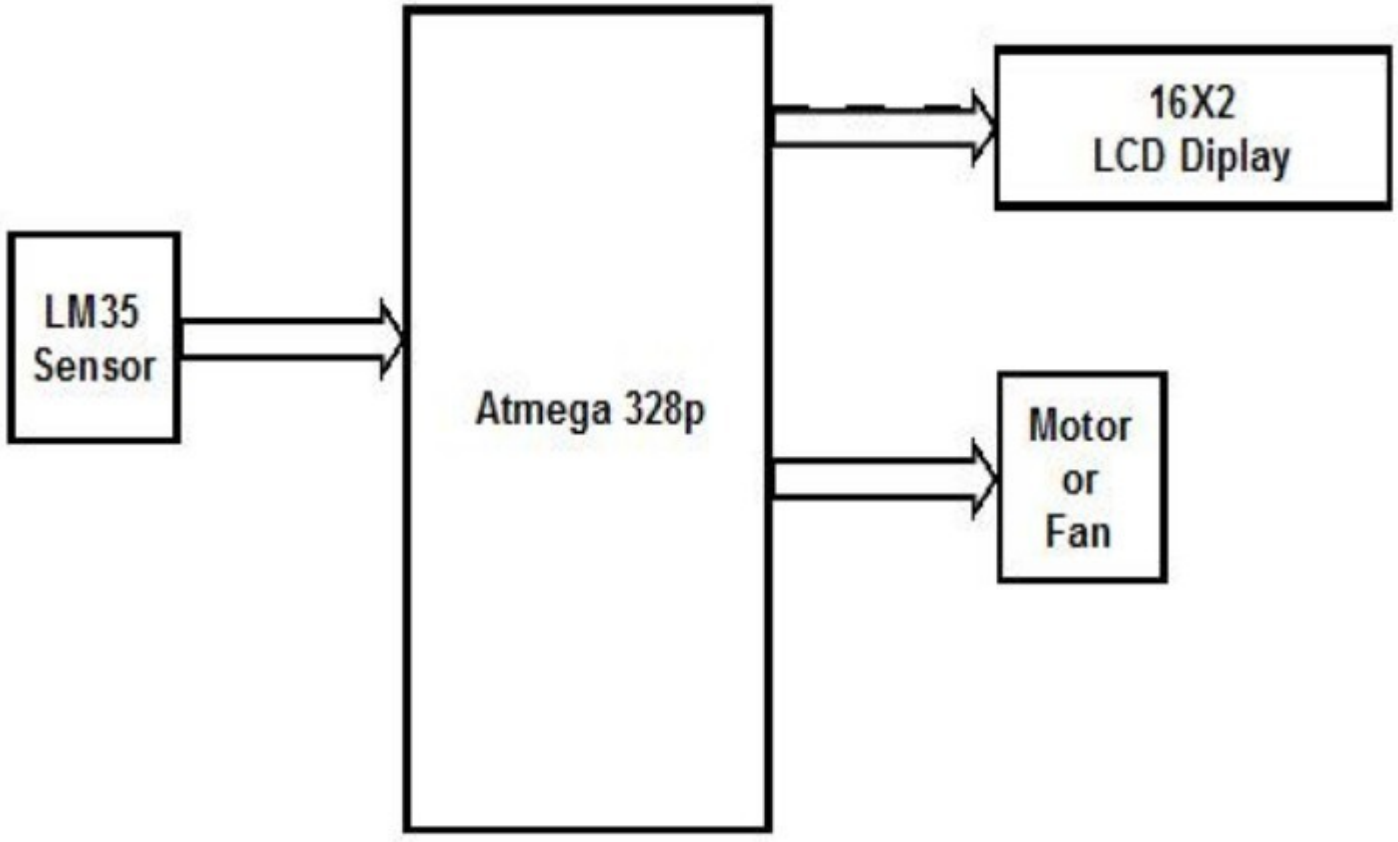


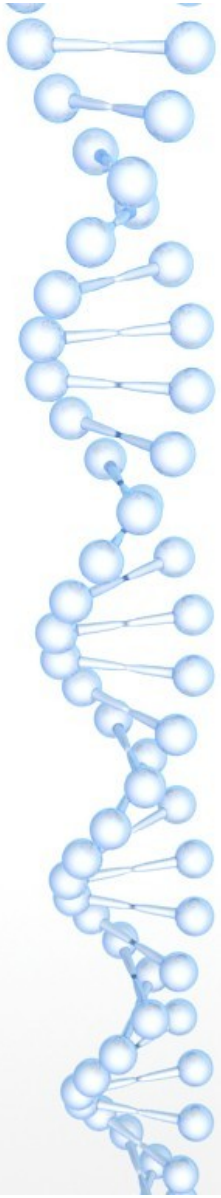
No	Symbol	Function
1	VSS	Ground
2	VDD	5V +
3	V0	Contrast
4	RS	Register
5	RW	Read/Write
6	E	Enable
7	D0	Data bus
8	D1	Data bus
9	D2	Data bus
10	D3	Data bus
11	D4	Data bus
12	D5	Data bus
13	D6	Data bus
14	D7	Data bus
15	A	Anode (5V+)
16	K	Cathode (GND)

Circuit Implementation



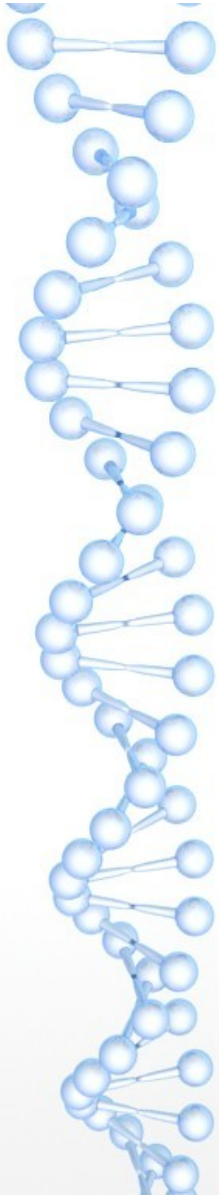
Block Diagram





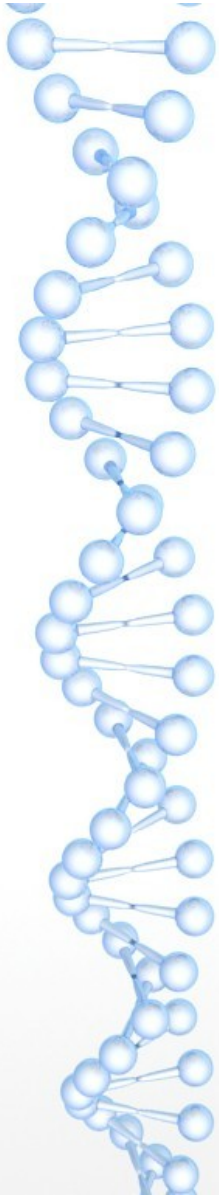
Applications

- Temperature based fan speed controller is useful for Cooling the processor in the laptops and personal computers “more efficiently”. Generally fan in laptop comes with only two or three possible speeds. So it results in more power consumption.
- The fan designed in this project, has different values of speed according to temperature change. This can be also used in small scale industries for cooling the electrical and mechanical equipment.
- It is also used in various temperature based controlling operations.



Advantages

- Automating the fan speed saves time and maintains a consistently comfortable environment.
- This helps us to curb Unnecessary Power dissipation and Saves power and helps us to utilize it efficiently.
- It is useful to assist the disabled people to adjust the fan speed automatically.
- Improves performance of the System.



Conclusion

- Arduino based temperature controlled fan is implemented.
- Thus the fan speed is controlled by using PWM(pulse width modulation) and arduino board according to the temperature sensed by the help of temperature
- The speed of the fan depends on the temperature and there is no need for regulating the fan speed manually again and again.