TEMPERATURE CONTOLLED FAN

Overview

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- Block Diagram
- Hardware Requirements
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- Applications
- Future Work
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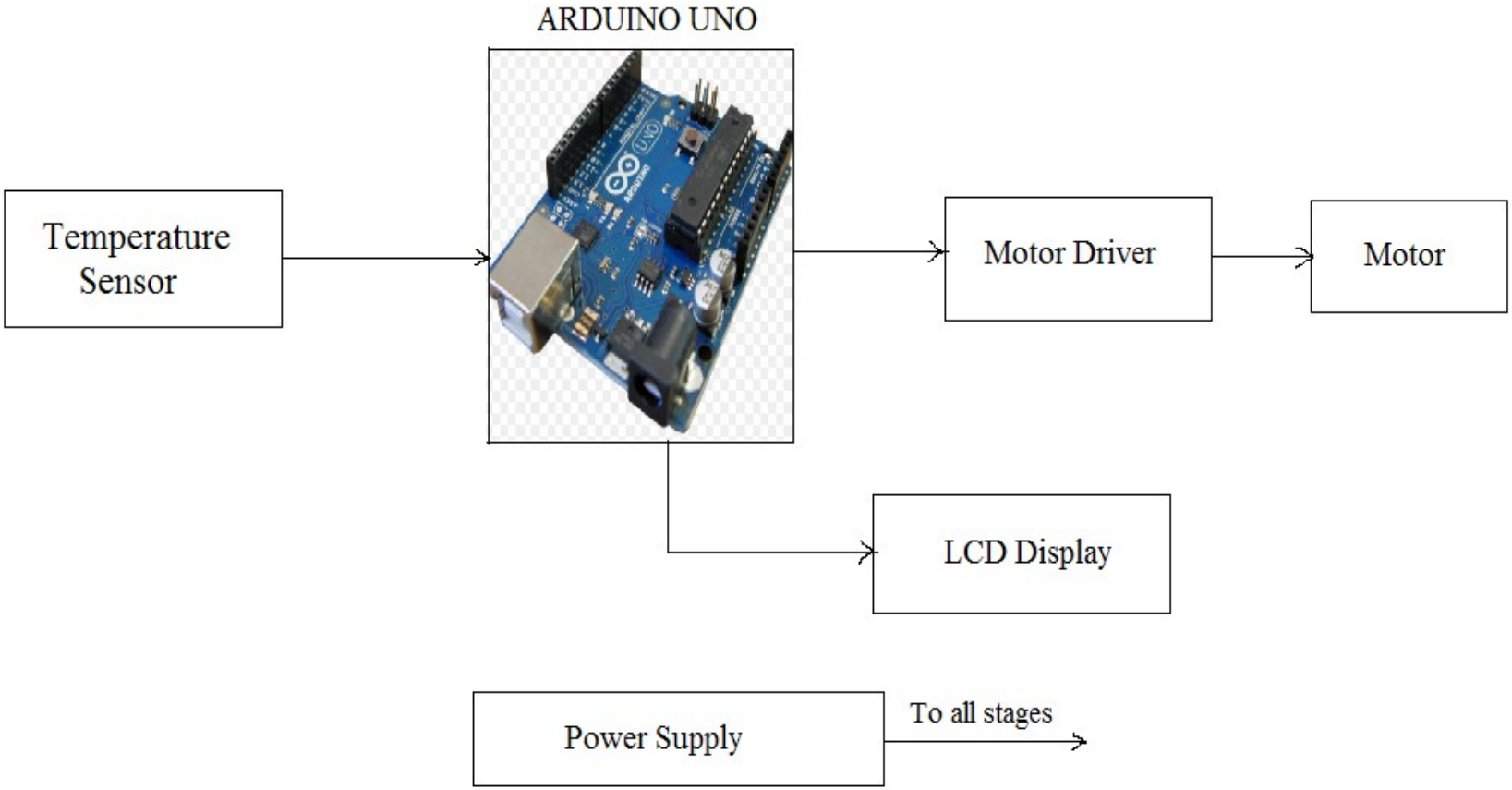
Introduction

- Temperature controller controls the temperature of any device according to its requirement.
- Temperature sensor is interfaced to analog pin of Arduino board.
- Pulse Width Modulation(PWM) output is fed to a DC Fan through a motor driver IC.
- Liquid Crystal Display(LCD) displays the temperature of the device.
- The fan speed is proportional to the temperature measured.

Block Diagram



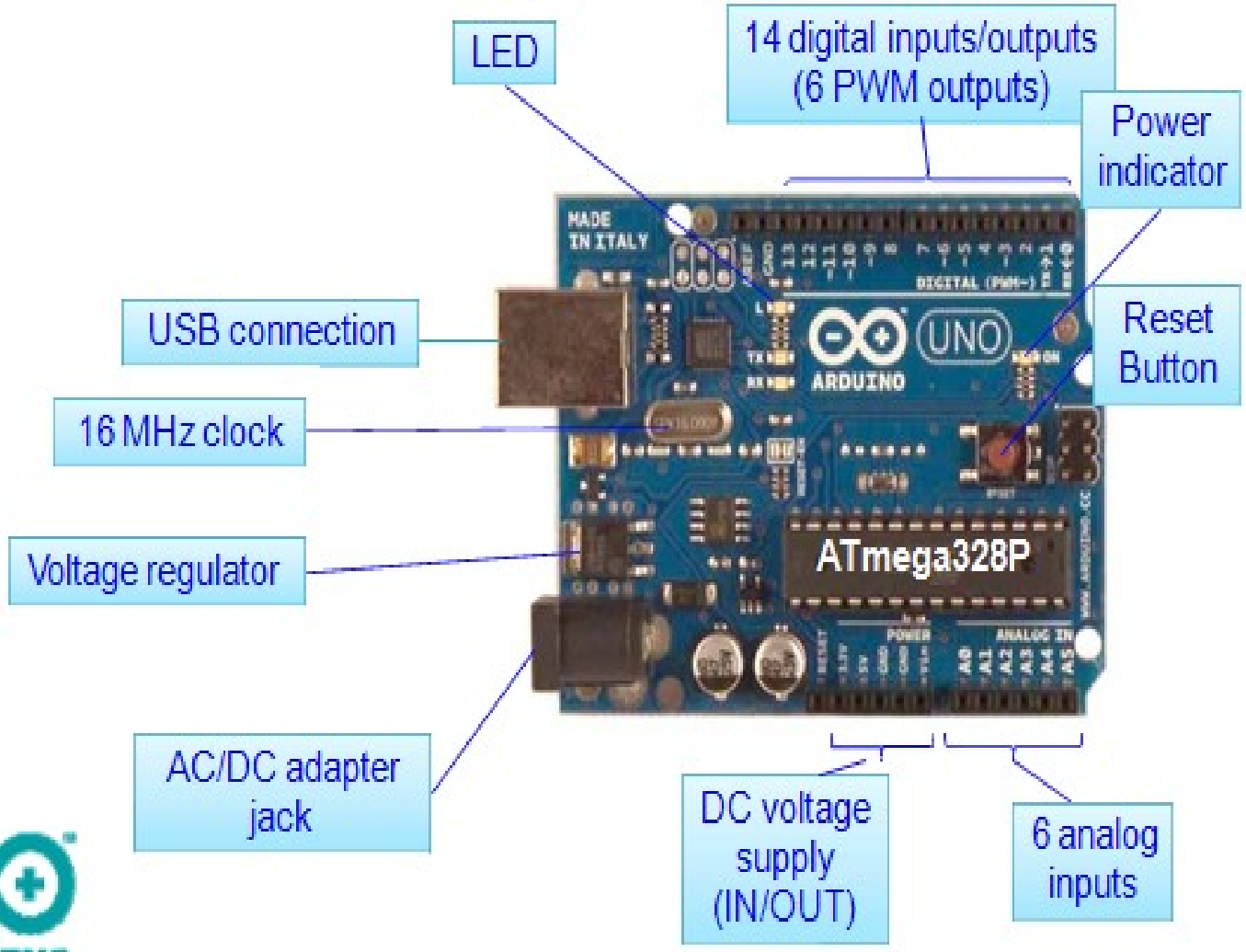
Hardware requirements

- Arduino UNO
- Temperature Sensor-LM35
- DC Motor Driver-L293D
- DC Motor
- Power Supply

Arduino UNO

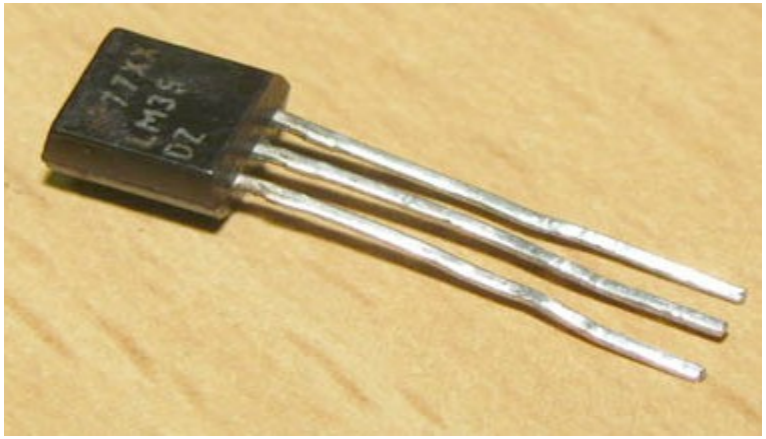
- The Arduino Uno is a microcontroller board based on the ATmega328P.
- 14 digital input/output pins (of which 6 can be used as PWM outputs)
- 6 analog inputs.
- 16 MHz quartz crystal
- A power jack
- Connect it to a computer with a USB cable or power it with a AC-to-DC adapter or battery to get started.

The board...

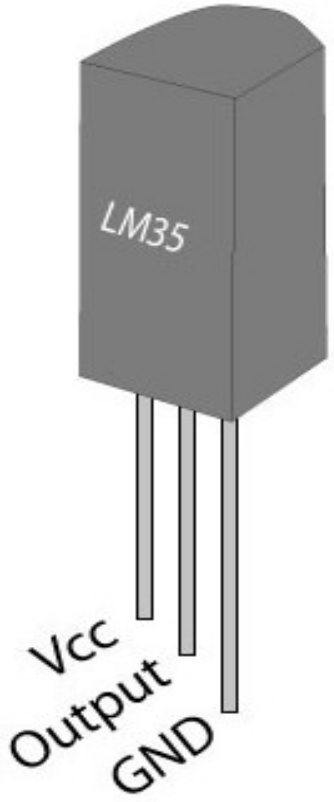

LED
14 digital inputs/outputs
(6 PWM outputs)
Power
indicator
USB connection
Reset
Button
16 MHz clock
Voltage regulator
ATmega328P
AC/DC adapter
jack
DC voltage
supply
(IN/OUT)
6 analog
inputs
MADE
IN ITALY
UNO
ARDUINO

Temperature Sensor(LM 35)

- Precision IC temperature sensor with its output proportional to the temperature (in ^{o}C).
- The user is not required to subtract a large constant voltage from its output to obtain convenient Centigrade scaling.
- It does not require any external calibration or trimming to provide typical accuracies over a full −55 to +150˚C temperature range.



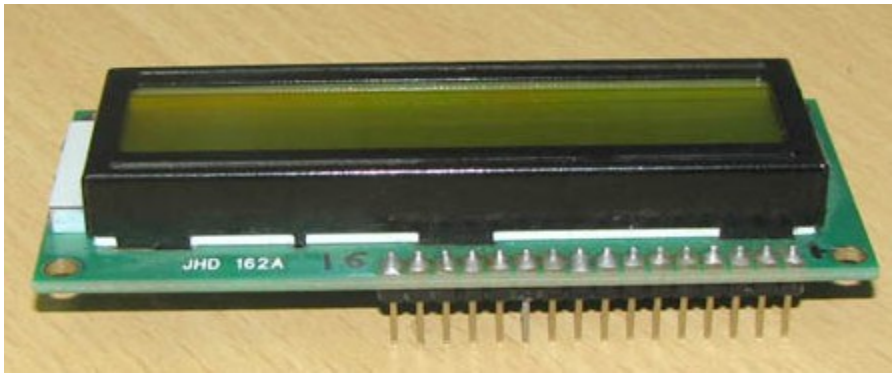
Pin Diagram



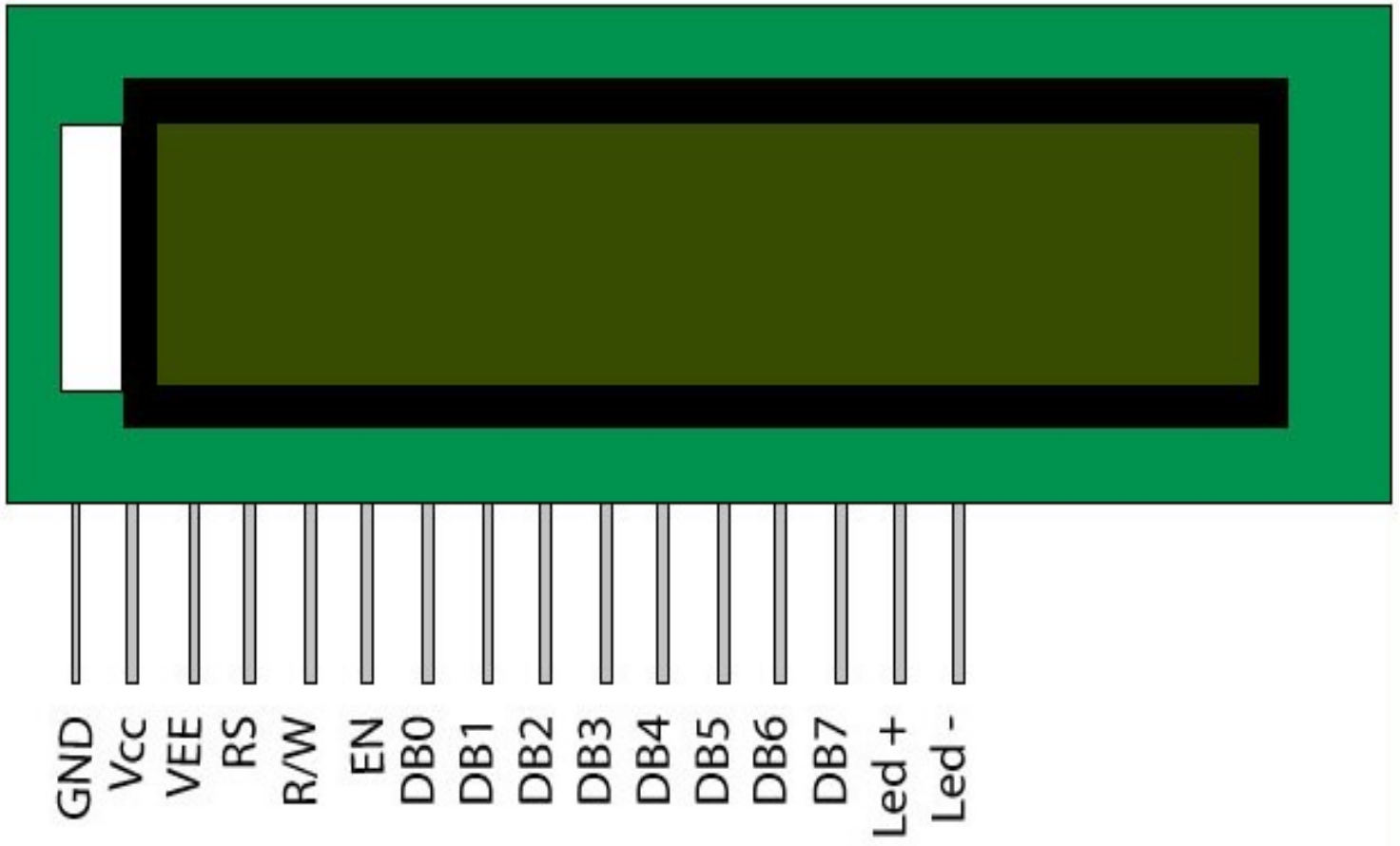
- LM35 digital sensor has got 3 pins VCC, GND and output pin.
- when it is heated the voltage at output pin increases, it is connected to the analog to digital convertor IC (ADC).

Liquid Crystal Display (LCD)

- LCD screen is an electronic display module.
- Most common LCDs connected to the microcontrollers are 16x2 and 20x2 displays.
- A 16x2 LCD means it can display 16 characters per line and there are 2 such lines.
- Each character is displayed in 5x7 pixel matrix.
- 16x2 LCD has two registers, Command and Data.



Pin Diagram



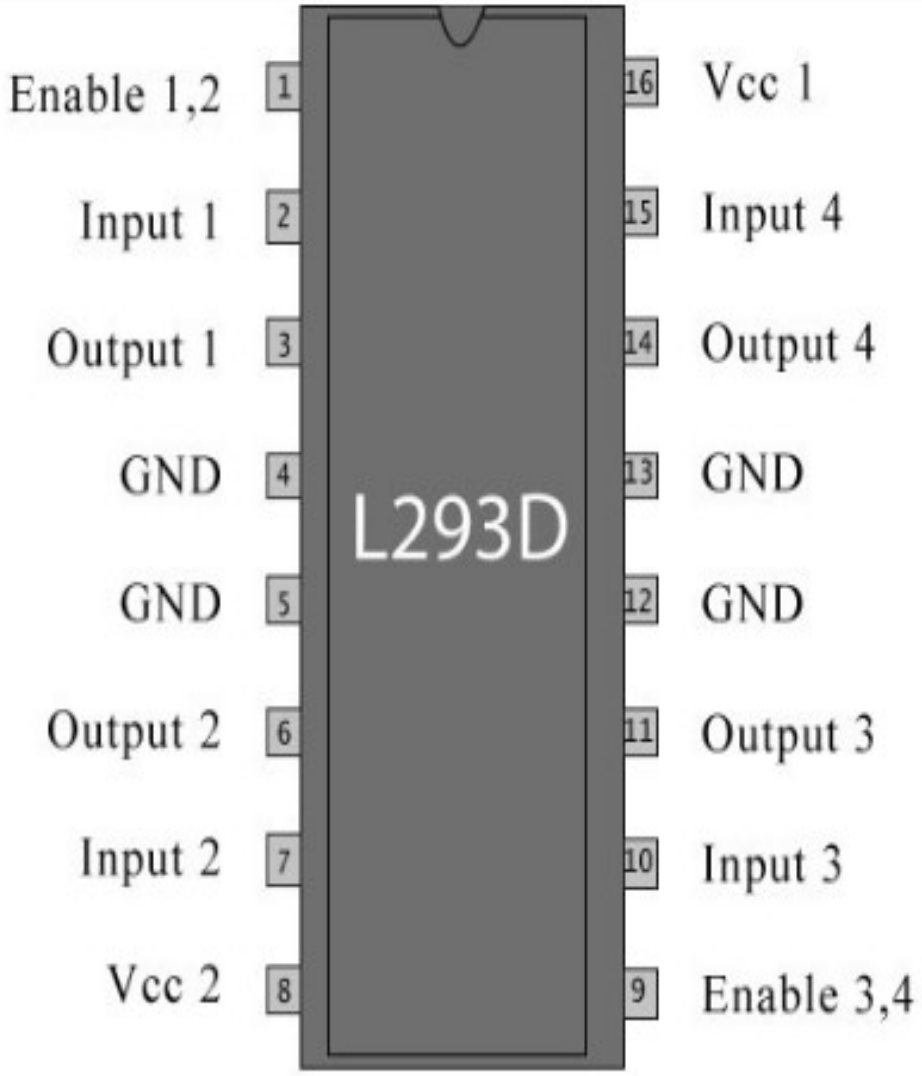
Why LCD??

- LCDs are,
  - economical
  - easily programmable
  - have no limitation of displaying
- In this module it displays the temperature of the device.

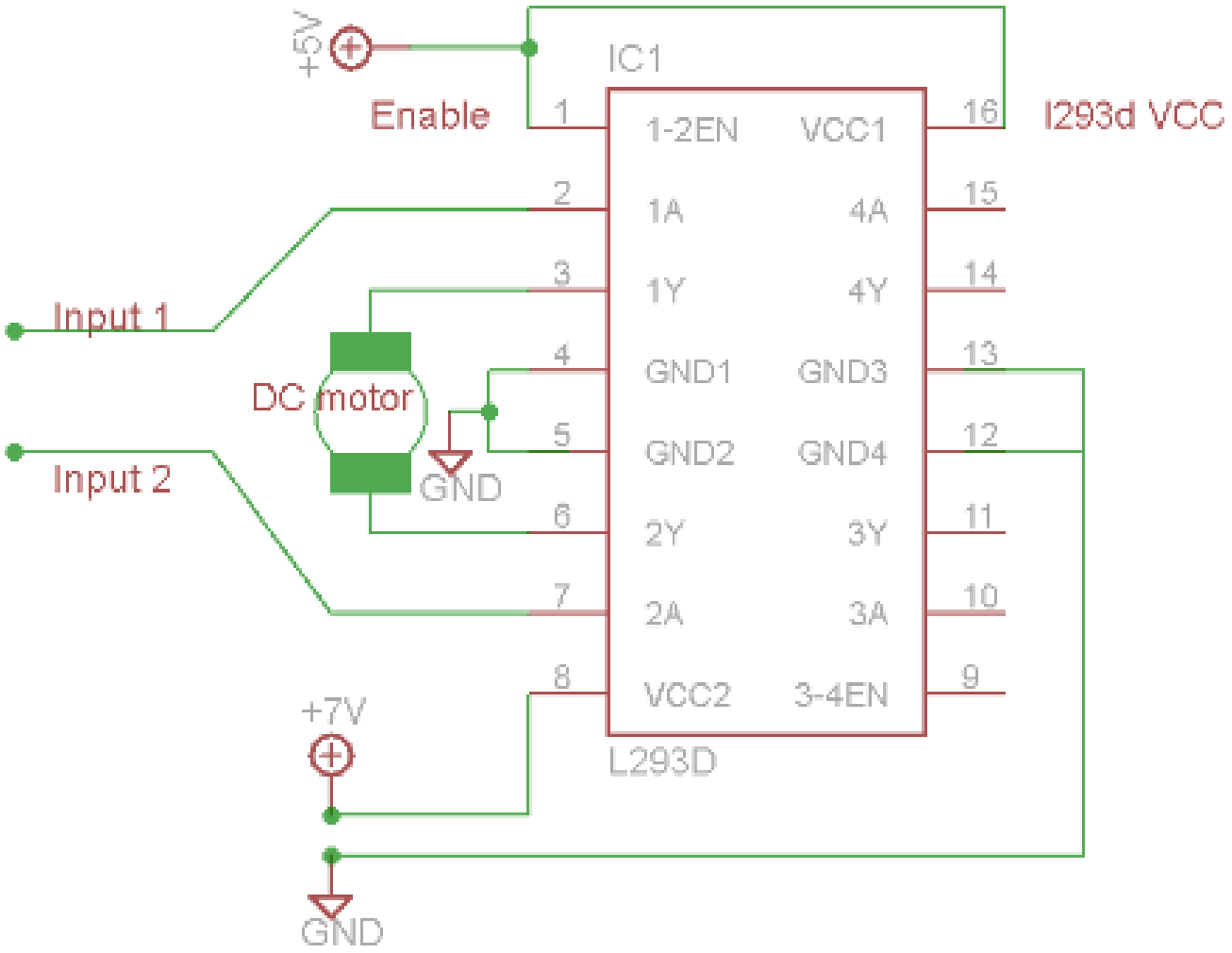
DC Motor Driver(L293D)

- L293D has quadruple high current half-H drivers.
- Wide Supply-Voltage Range: 4.5 V to 36 V
- High-Noise-Immunity Inputs
- Output Current 600mA Per Channel
- Peak Output Current 1.2A Per Channel.

Pin Diagram

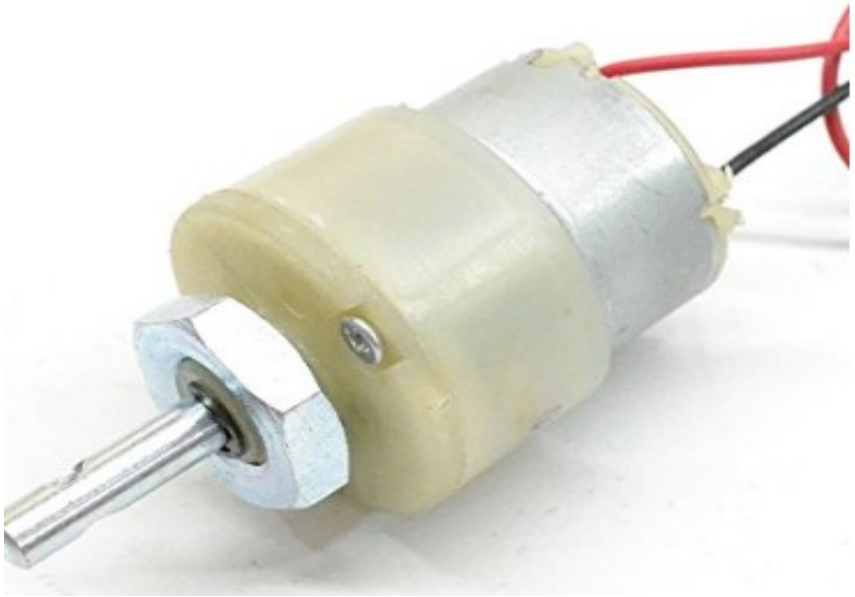

Enable 1,2
1
Input 1
2
Output 1
3
GND
4
GND
5
Output 2
6
Input 2
7
Vcc 2
8
L293D
16
Vcc 1
15
Input 4
14
Output 4
13
GND
12
GND
11
Output 3
10
Input 3
9
Enable 3,4

Circuit Diagram

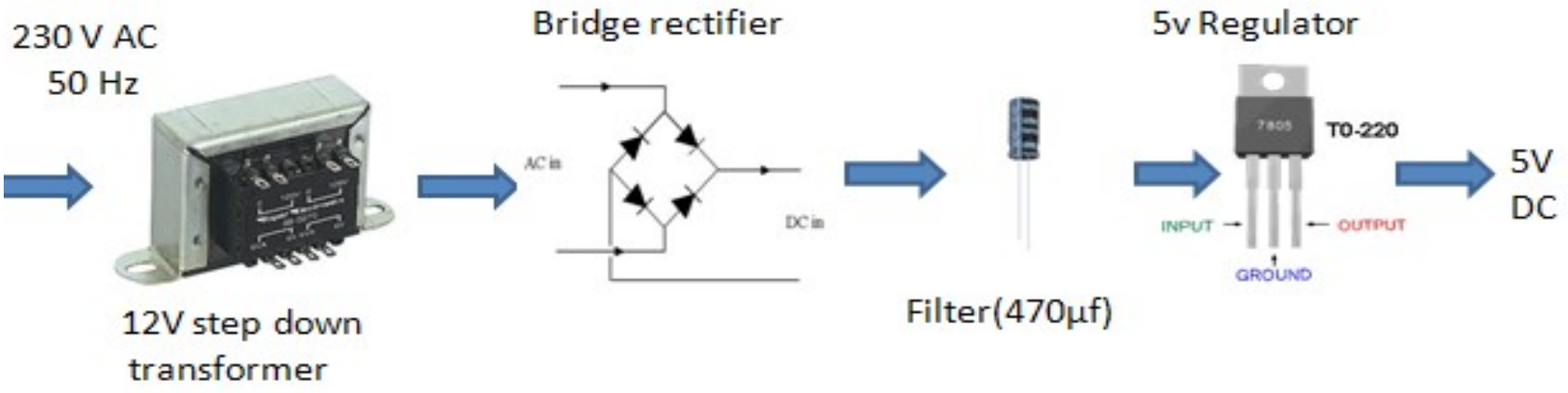


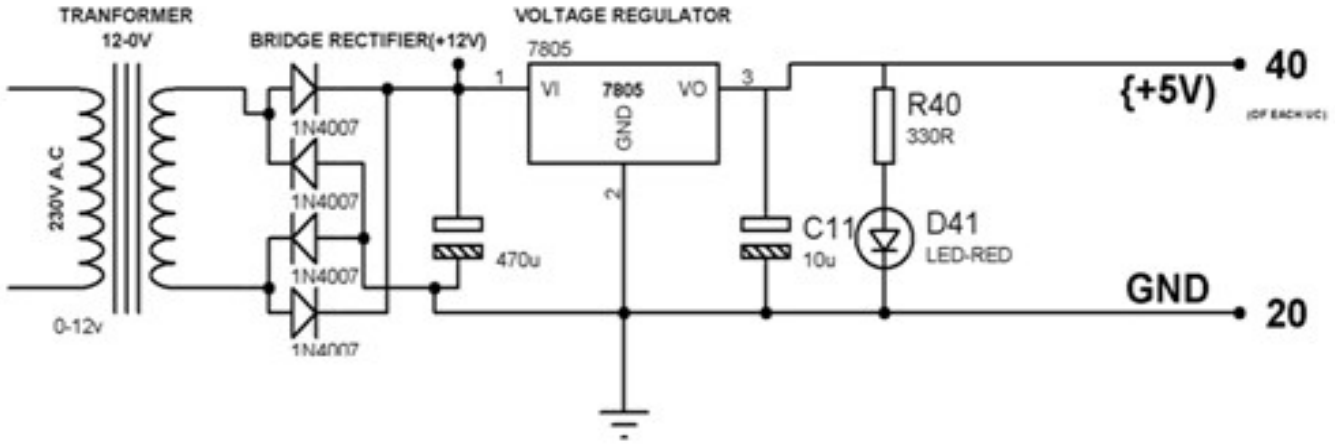
DC Motor

- 10 to 200RPM 12V DC motors with Gearbox
- 6mm shaft diameter with internal hole
- No-Load Current=60mA(max)
- Load Current=300mA(max)



Power Supply





Software Used

- Arduino IDE

Programming Languages Used

- Embedded C/C++

Applications

- This module can be used everywhere where power consumption has to be controlled
- It can be use to cool the processor in computers.

Future Work

- This concept can be utilized further by interfacing it with more device like Air conditioner.
- User-defined temperature settings can be done using push buttons provided through Arduino board.

References

- www.atmel.com
- www.arduino.org
- www.beyondlogic.org
- www.wikipedia.org
- www.elementzonline.com
- www.elementztechblog.wordpress.com

Questions????

THANK YOU