Embedded System

Class-01 : The Multimeter.

Learning:

- Ohm's Law

$$I = \frac{V}{R}$$

- How to use Multimeter?

measuring: 1) Resistance
2) voltage
3) current (AC, DC)

Class 02: Dimming LEDs

Learning: How to control brightness of LED?

- by PWM (Pulse width Modulation)

if V↓ I↓ (Consumed Less) LED darken.

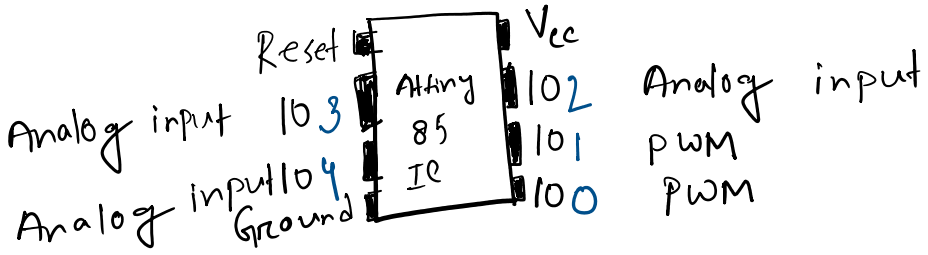
But, applying fixed voltage:

brightness control by PWM.

Class 03: Programming an attiny + Homemade Arduino Shield.

Learning: Arduino Attiny 85

microcontroller = Attiny 85



* Arduino ATTiny 85:

Pin 13 --> 102

Pin 12 --> 101

Pin 11 --> 100

Pin 10 --> Reset

5V --> Vcc

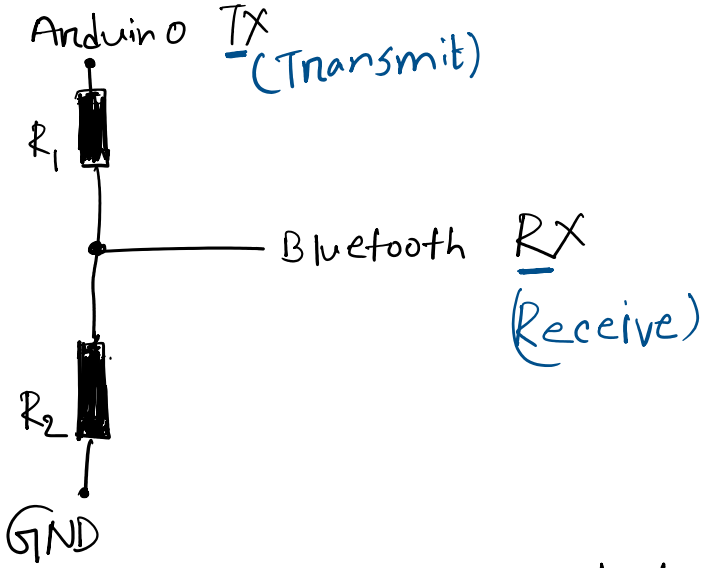
GND --> Ground

Class 04:

Class 04:

Learning: Arduino + Bluetooth + Android

Bluetooth = great way to transfer data.
android app = S2 terminal for bluetooth.

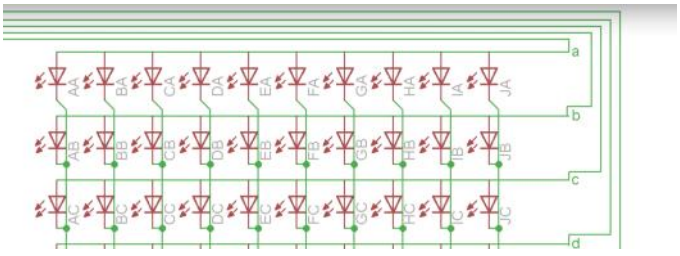


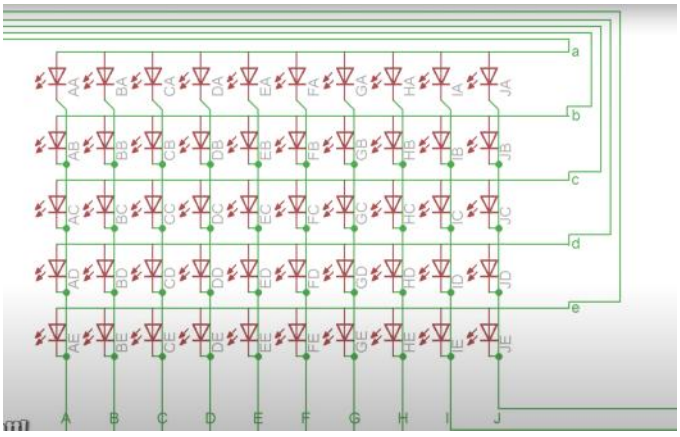
connected TX and RX - when upload the code.

Class 05:

Learning: How to Mutiplex?

Building 4X4 RGB LED Matrix.



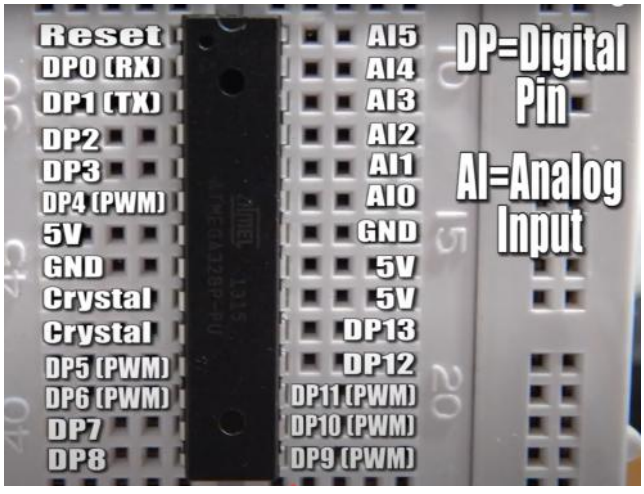


If connect Bb, BB (Light on)

Class 06:

Learning to Standalone Arduino Circuit

- No reset switch
- Only 5v input
- No USB -> Serial connection.
- No short circuit protection.
- No overvoltage protection.

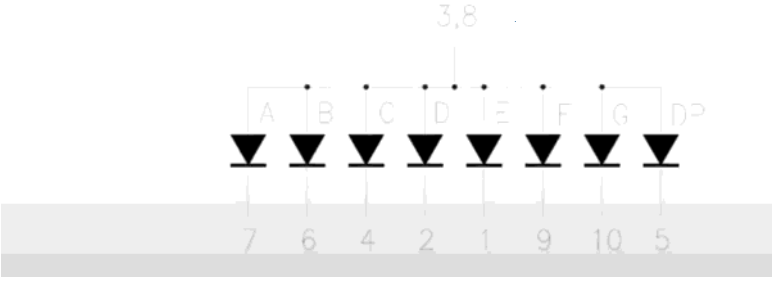


Class 07:

Learning: Segment Display.

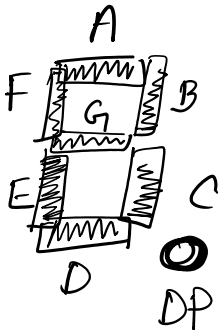
#Connected through common Anode.

INTERNAL CIRCUIT DIAGRAM



PIN CONNECTION

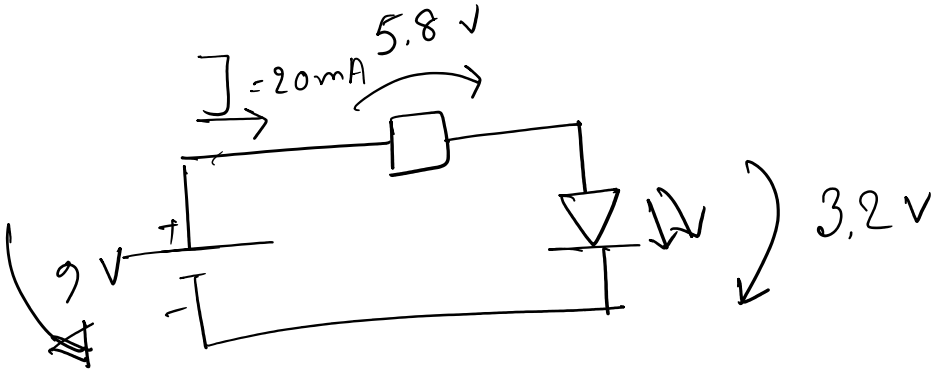
No.	CONNECTION
1	CATHODE E
2	CATHODE D
3	COMMON ANODE
4	CATHODE C
5	CATHODE DP
6	CATHODE B
7	CATHODE A
8	COMMON ANODE
9	CATHODE F
10	CATHODE G



Class 8:

Learning: LED and current limiting resistance

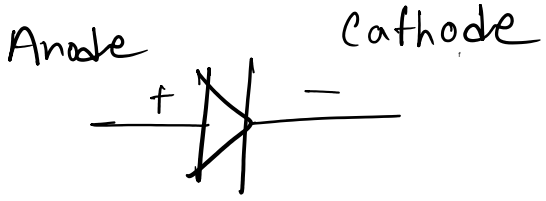
* KVL: $\sum_{K=1}^{n} V_K = 0$



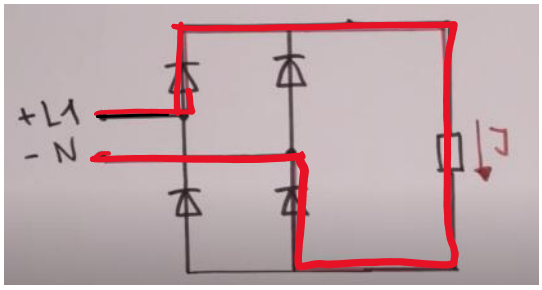
Class 09:

Learning: Diodes and bridge Rectifiers

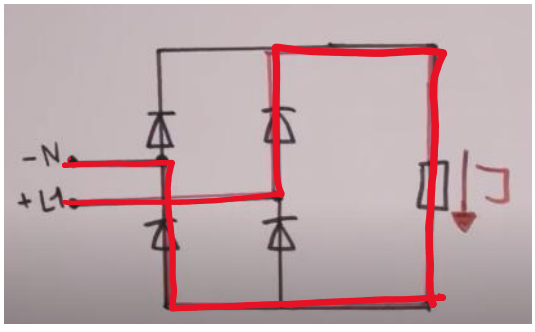
Learning: Diodes and bridge Rectifiers



RMS = Root Mean Squarre.

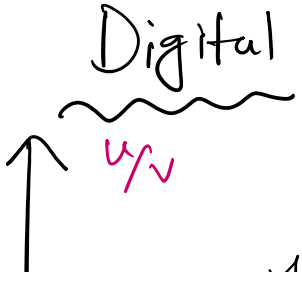


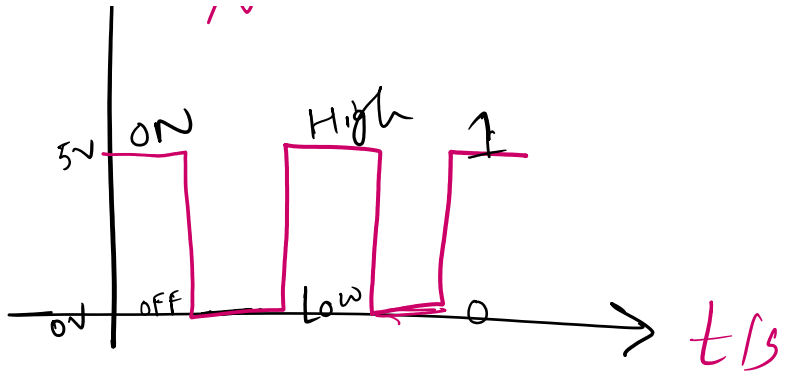
Change the polarity:



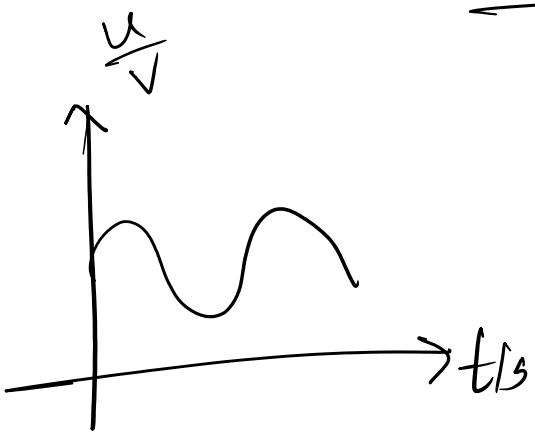
#Class 10:

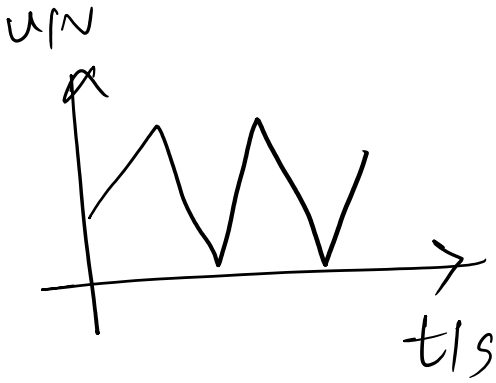
Learning: Digital to Analog converten. (DAC)

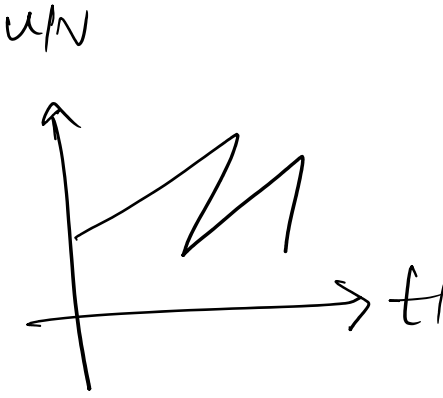


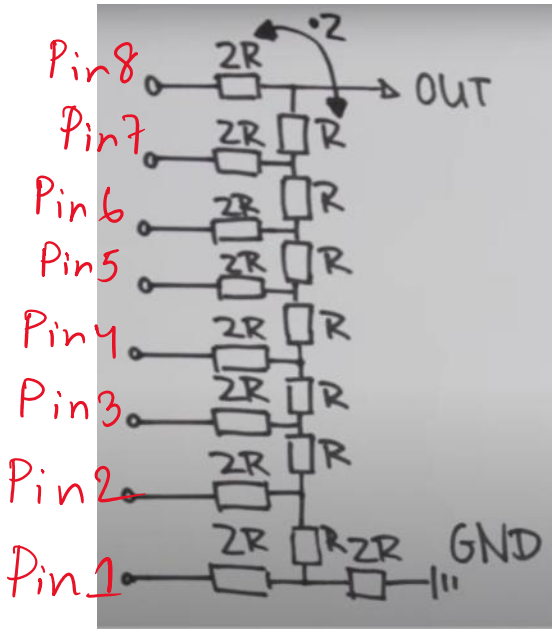

5V
ON
High
1
0V
OFF
Low
0
t/s

Analog


U/V
t/s


U/V
t/s


U/V
t


Pin8
Pin7
Pin6
Pin5
Pin4
Pin3
Pin2
Pin1
2R
R
·2
OUT
GND