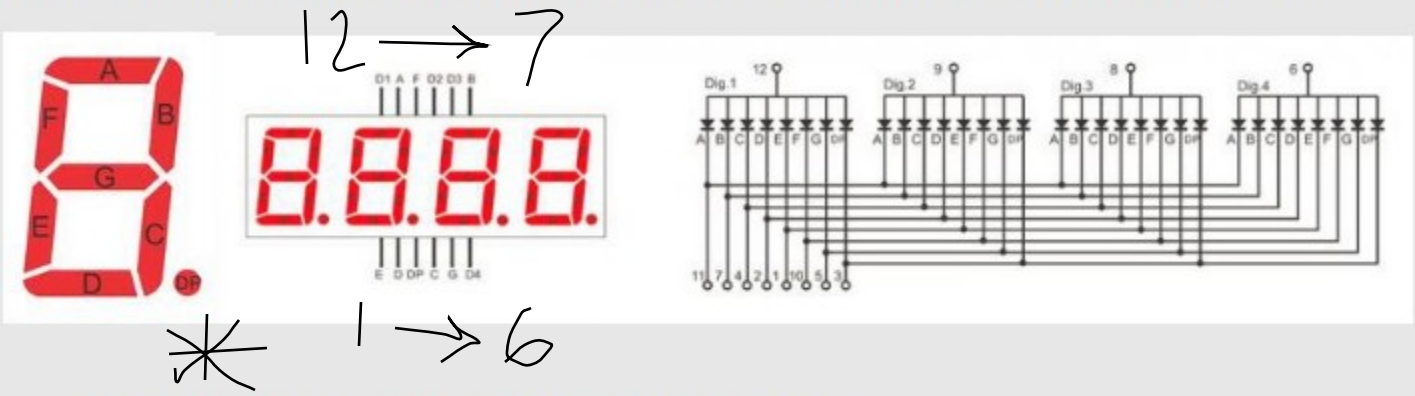
A 4-digit 7-segment LED display has 12 pins. 8 of the pins are for the 8 LEDs on each of the 7 segment displays, which includes A-G and DP (decimal point). The other 4 pins represent each of the 4 digits from D1-D4.

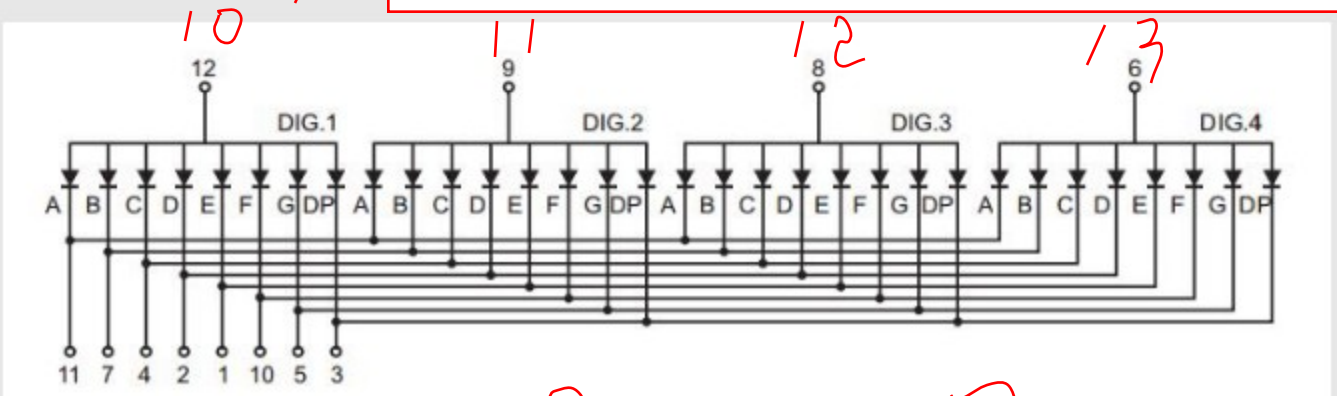


COMMON ANODE OR COMMON CATHODE

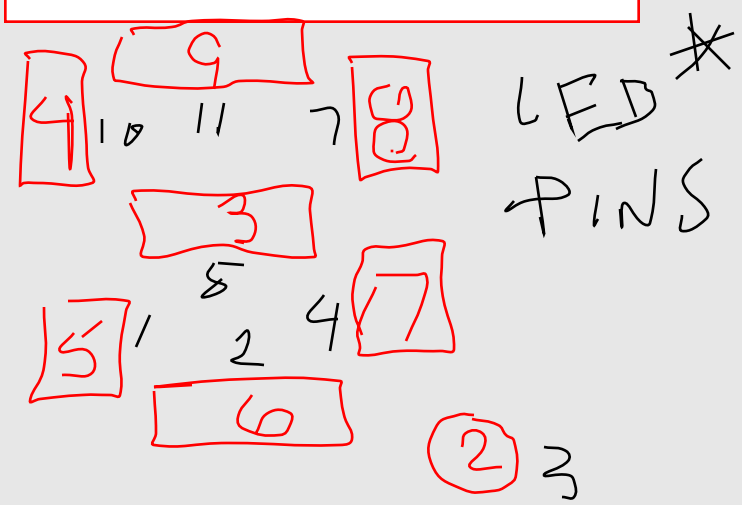
Each segment in the display module is multiplexed, meaning it shares the same anode connection points. And each of the four digits in the module have their own common cathode connection point. This allows each digit to be turned on or off independently. Also, this multiplexing technique turns the massive amount of microcontroller pins necessary to control a display into just eleven or twelve (in place of thirty-two)!

Digital Arduino Pins Used in Red for Common Anode 4 Digit Display
4 Digits (L-R): LED Pin 12, 9, 8, 6 ==> "HIGH" to light
7 Segments Plus Decimal Point LED Pins, 11,7,4,2,1,10,5,3 ==> "LOW" to light

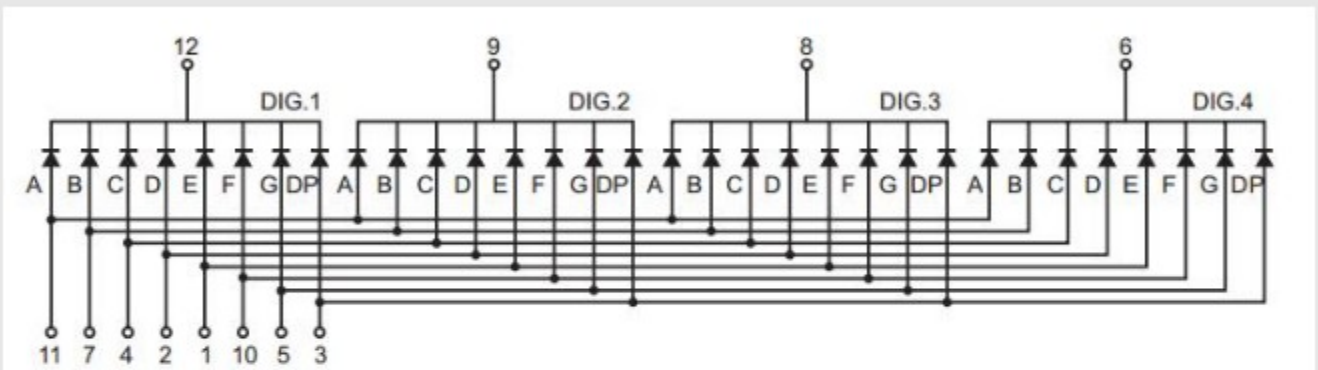
Common Anode



ref.:
https://osoyoo.com/2017/08/08/arduino-lesson-4-digit-7-segment-led-display/



Common Cathode



MULTIPLEXING TECHNIQUE

So how we are going to display a number like 1234 on this 4 digit display? For this we are going to use a method called **multiplexing**. What multiplexing does is simple – show one digit at a time on a display unit and switch between display units very fast. Due to persistence of vision, human eye can not differentiate between which display is ON/OFF. The human eye just visualizes all the 4 display units to be ON all the time. Let's say we need to show 1234. First we turn on the segments relevant to "1" and turn on the 1st display unit. Then we send signals to show "2", turn off 1st display unit and turn on 2nd display unit. We repeat this process for next two numbers and switching between display units should be done very fast (about within one second delay). As our eyes can't pick a change occurring repeatedly to any object within 1 second, what we see is 1234 appearing on the display at the same time.