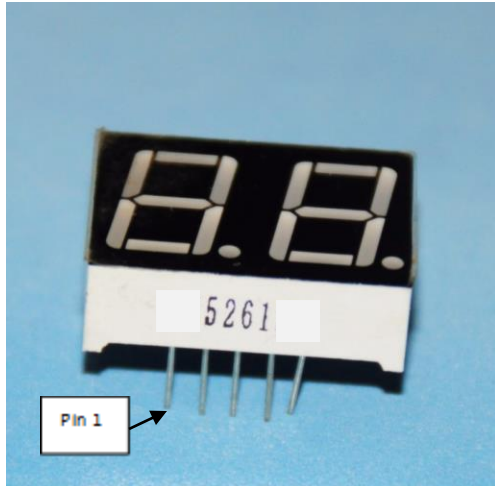
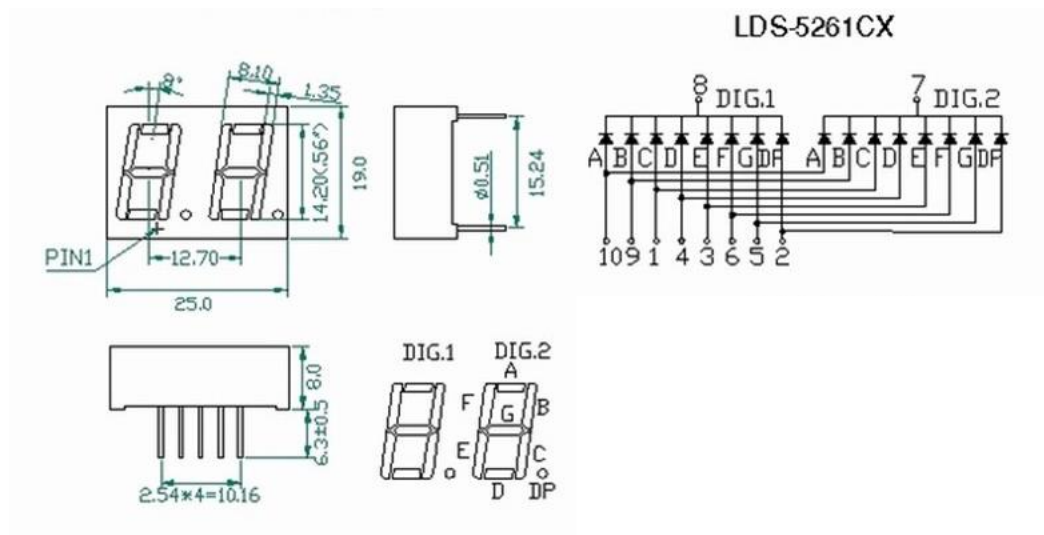


GoldSTEM_Lesson_12_ Seven_Segment_Display_Counting_00_99

For this experiment we will be using a new component the dual seven segment multiplexed Common Cathode display.



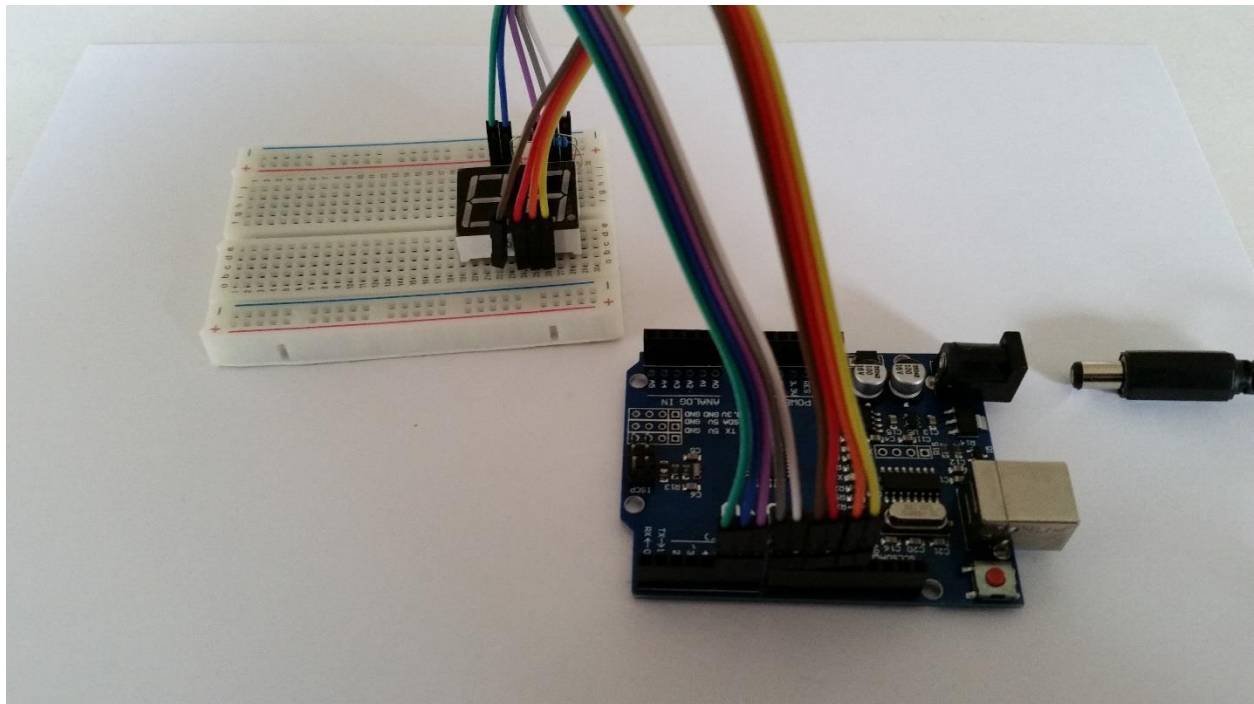
- Pin 1 of the unit is the front left most pin
- Pin 5 is the front right most pin
- Pin 6 is the back right
- Pin 10 is the back left

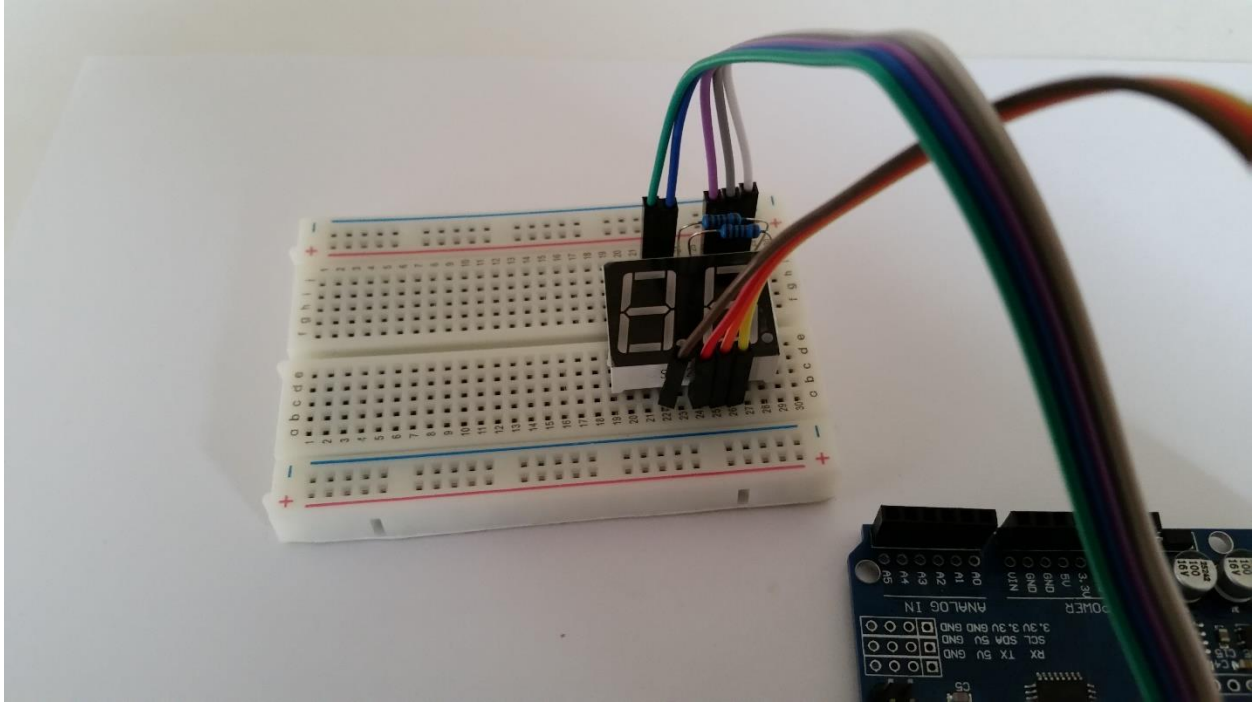


Common Cathode means all of digit 1 cathodes are connected together at pin 8
All of digit 2 cathodes are connected together at pin 7

This chart shows the 7 SEG pin numbers the pin connection to the UNO and the UNO pin numbers that have to be high for each of the numeric numbers from 1-9.

7 SEG		UNO	0	1	2	3	4	5	6	7	8	9
1	C	10	H	H	H	H	H	H	H	H	H	H
2	N/C											
3	E	11	H						H		H	
4	D	12	H		H	H		H	H		H	
5	G	13			H	H	H	H	H		H	H
6	F	7	H				H	H	H		H	H
7	DIG 2	8										
8	DIG 1	9										
9	B	6	H	H	H	H	H			H	H	H
10	A	5	H		H	H		H		H	H	H





Wiring the circuit

We tried to make the wiring of this circuit as straight forward as possible.

Seven segment display pin 1 in c22, lower left pin on the display.

Pin 5 will end up in c26

Pin 6 in g26

Pin 10 in g22

R1 Resistor 1K, h25 to h27

R2 Resistor 1K, i24 to i28

Yellow jumper a26 to UNO Digital 13

Orange jumper a25 to UNO Digital 12

Red jumper a24 to UNO Digital 11

Brown jumper a22 to UNO Digital 10

White Jumper j28 to UNO Digital 9

Grey Jumper j27 to UNO Digital 8

Purple Jumper j26 to UNO Digital 7

Blue Jumper j23 to UNO Digital 6

Green Jumper j22 to UNO Digital 5

That wasn't so bad was it?

Notes are at the end of this experiment

Load the Code

```
/*
GoldSTEM_Lesson_12_Seven_Segment_Display_Counting_00_99 GoldSTEM tm 3-7-2016

*/

// Arduino digital pins used to light up
// corresponding segments on the LED display
#define A 5
#define B 6
#define C 10
#define D 12
#define E 11
#define Fs 7
#define G 13

// Pins driving common cathode
#define CC1 9
#define CC2 8

// Pins for A B C D E F G, in sequence
const int segs[7] = { A, B, C, D, E, Fs, G };

// Segments that make each number
const byte numbers[10] = { 0b01111111, 0b00001110, 0b10110111, 0b10011111, 0b11001110, 0b11011101,
0b11111101, 0b00001111, 0b11111111, 0b11011111 };

void setup() {
  pinMode(A, OUTPUT);
  pinMode(B, OUTPUT);
  pinMode(C, OUTPUT);
  pinMode(D, OUTPUT);
  pinMode(E, OUTPUT);
  pinMode(Fs, OUTPUT);
  pinMode(G, OUTPUT);
  pinMode(CC1, OUTPUT);
  pinMode(CC2, OUTPUT);
}

void loop() {
  for (int digit1=0; digit1 < 10; digit1++) {
    for (int digit2=0; digit2 < 10; digit2++) {
```

```
    unsigned long startTime = millis();
    for (unsigned long elapsed=0; elapsed < 600; elapsed = millis() - startTime){
        lightDigit1(numbers[digit1]);
        delay(5);
        lightDigit2(numbers[digit2]);
        delay(5);
    }
}
}
```

```
void lightDigit1(byte number){
    digitalWrite(CC1, LOW);
    digitalWrite(CC2, HIGH);
    lightSegments(number);
}
```

```
void lightDigit2(byte number){
    digitalWrite(CC1, HIGH);
    digitalWrite(CC2, LOW);
    lightSegments(number);
}
```

```
void lightSegments(byte number) {
    for (int i = 0; i < 7; i++) {
        int bit = bitRead(number, i);
        digitalWrite(segs[i], bit);
    }
}
```

Notes

Interesting lesson

Why did we only use two resistors and not seven?

Why was there no +5 and ground in this experiment?

Why do both digits look like they are on at the same time?