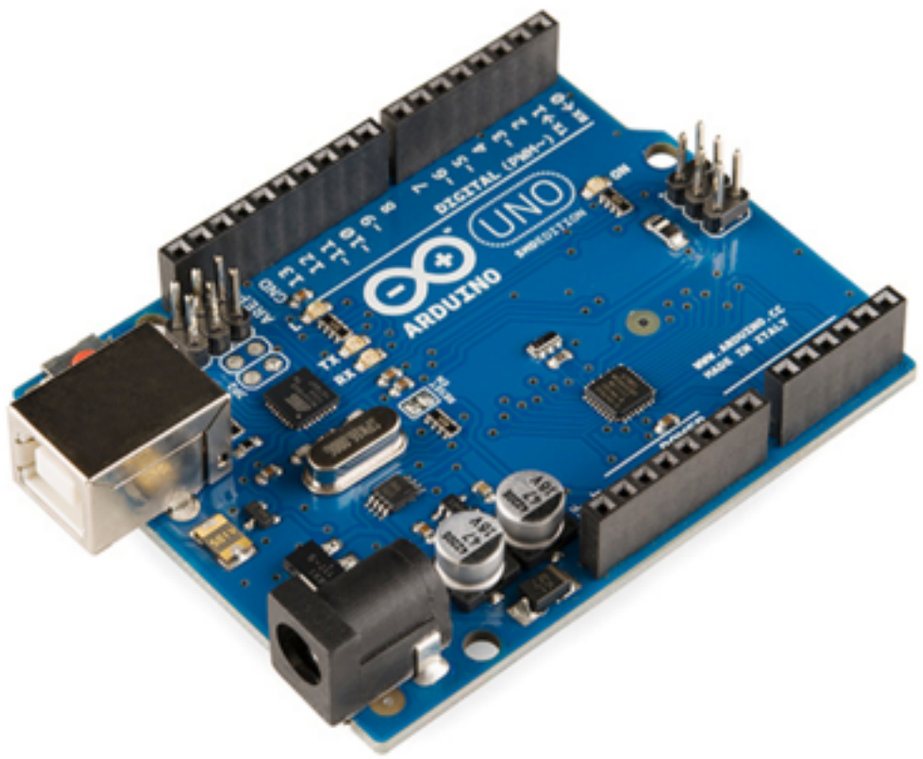
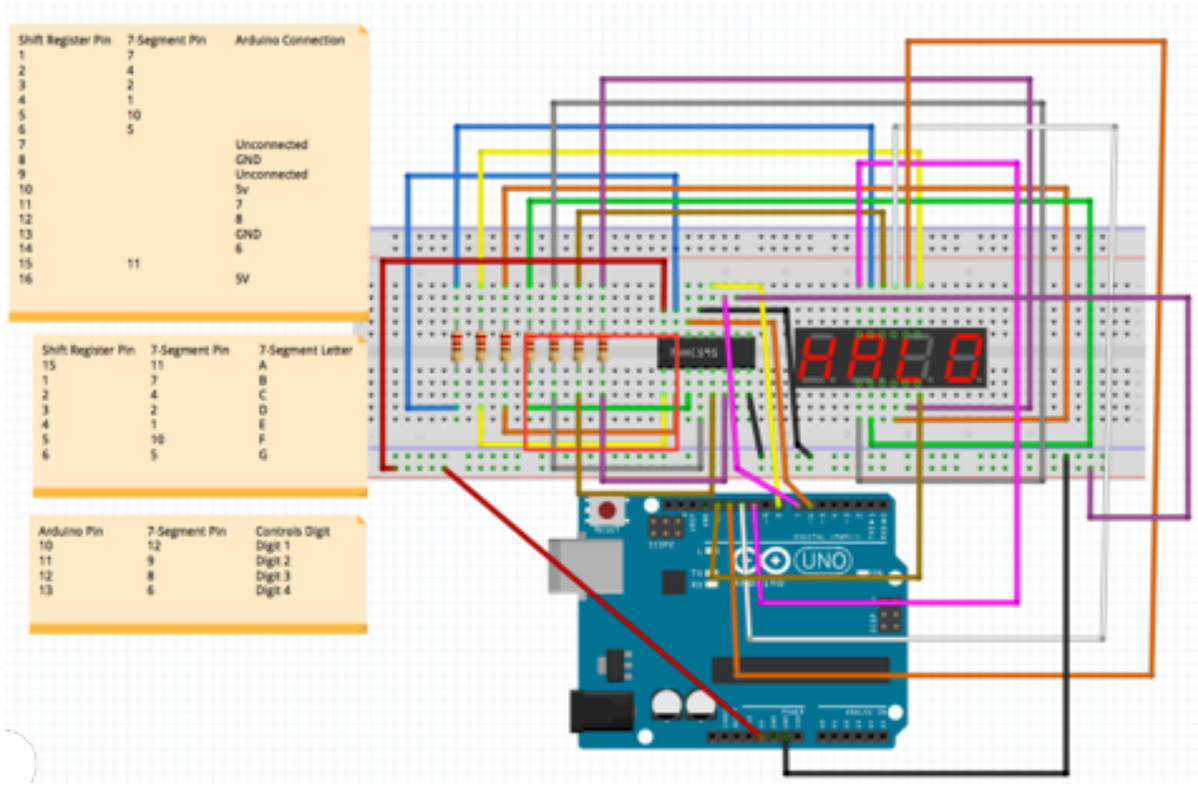




Arduino Bootcamp : Learning Through Projects

Stopwatch - Controlling a 4 Digit Segment Display with a Shift Register - Part 2

Project Objectives

- In this project you will learn:
  - Understand how a shift register works
  - Using a shift register to control the 4 digit seven segment display
  - Using the shiftOut() function

Parts

- Arduino Uno
- USB A-B cable
- Breadboard
- 4 Digit Seven Segment Display (Common Anode)
- 8-Bit Shift Register (SN74HC595)
- 7 x 220 ohm resistors
- Connecting wires

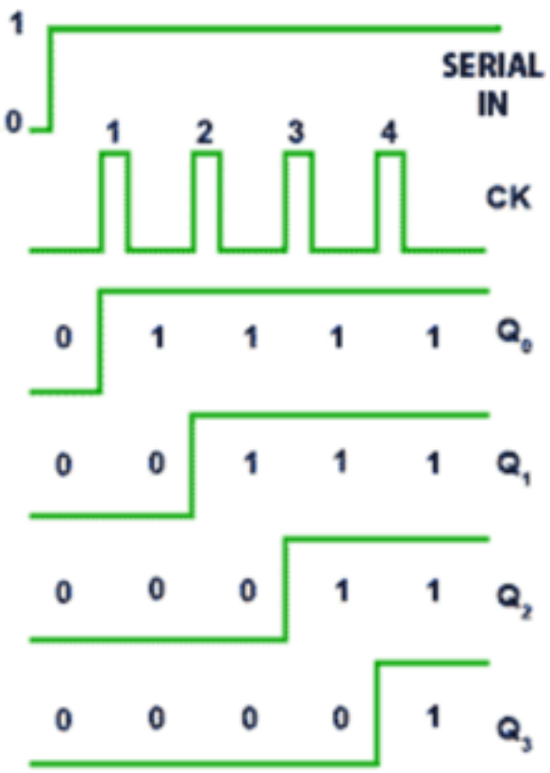
Shift Register Operation

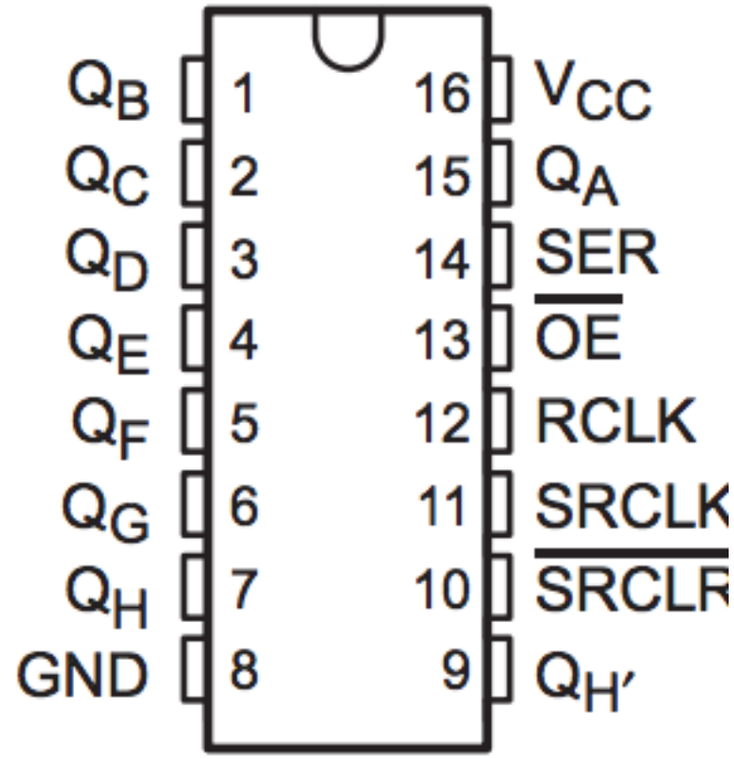
Serial In - Parallel Out

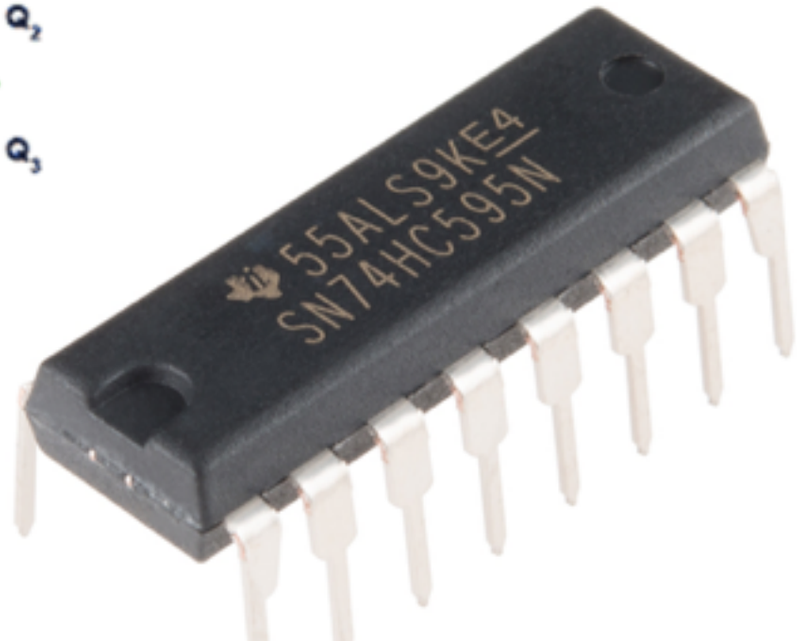
State Table

	After CK Pulse				
	0	1	2	3	4
Q_0	0	1	1	1	1
Q_1	0	0	1	1	1
Q_2	0	0	0	1	1
Q_3	0	0	0	0	1

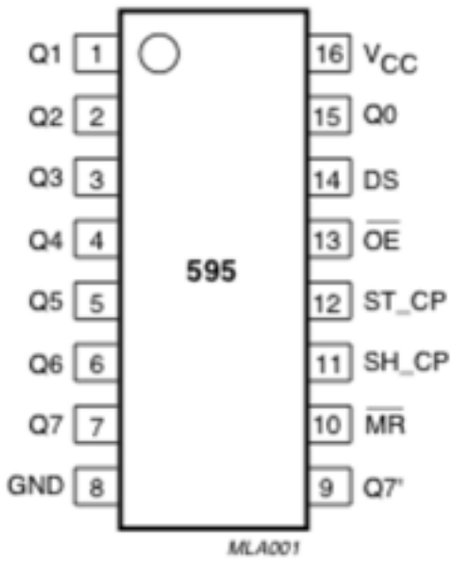
Timing Diagram





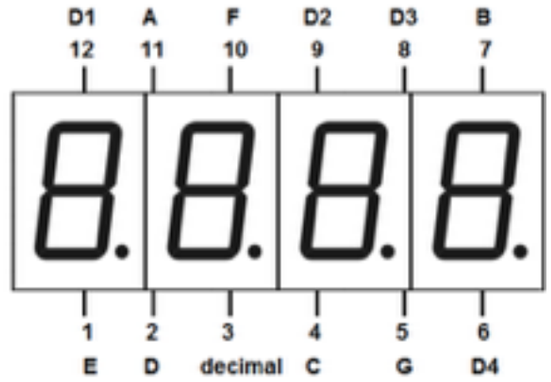


74HC595 Pinout



PINS 1-7, 15	Q0 " Q7	Output Pins
PIN 8	GND	Ground, Vss
PIN 9	Q7"	Serial Out
PIN 10	MR	Master Reclear, active low
PIN 11	SH_CP	Shift register clock pin
PIN 12	ST_CP	Storage register clock pin (latch pin)
PIN 13	OE	Output enable, active low
PIN 14	DS	Serial data input
PIN 16	Vcc	Positive supply voltage

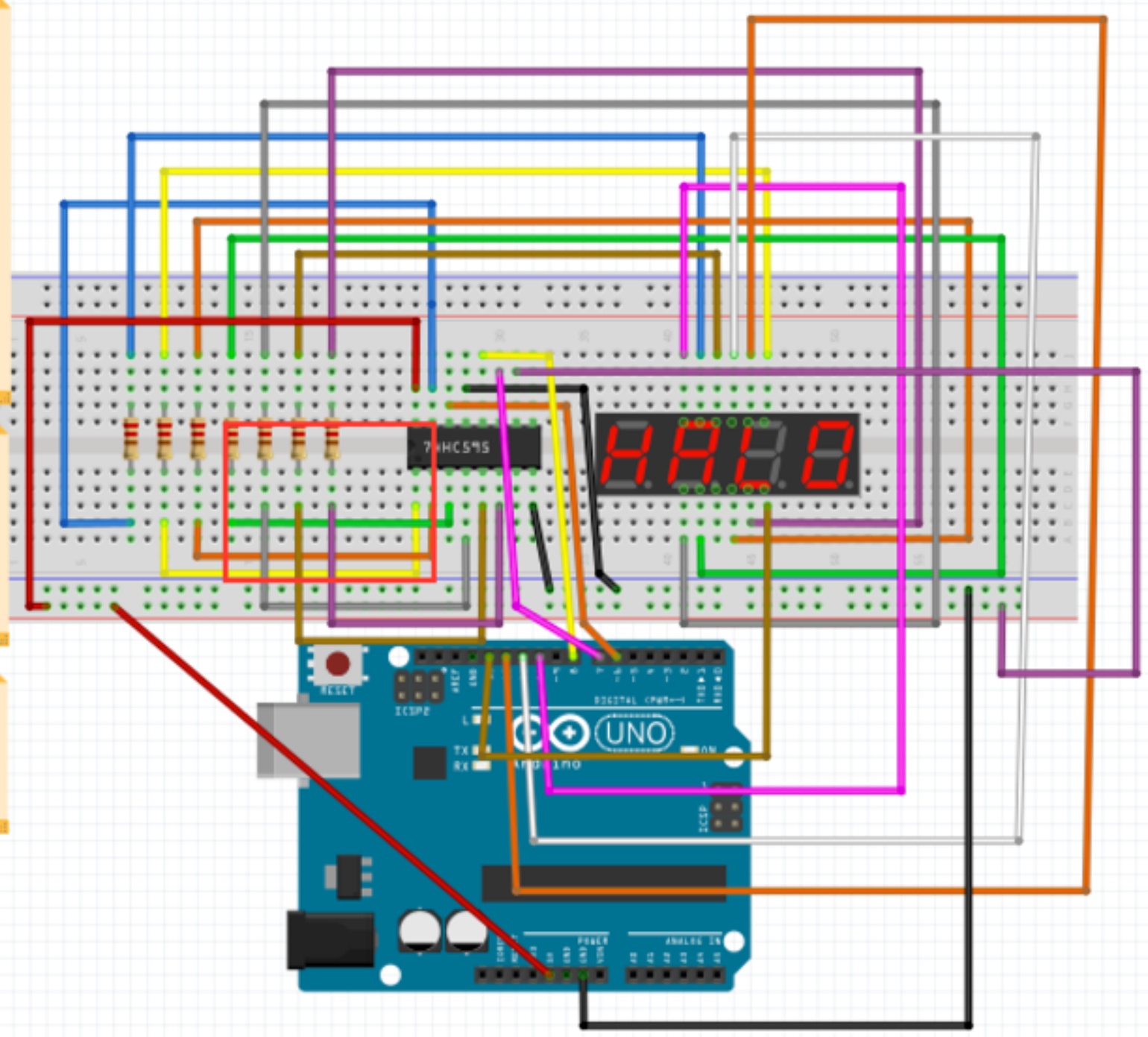
Circuit Diagram



Shift Register Pin	7-Segment Pin	Arduino Connection
1	7	
2	4	
3	2	
4	1	
5	10	
6	5	
7		Unconnected
8		GND
9		Unconnected
10		5v
11		7
12		8
13		GND
14		6
15	11	
16		5V

Shift Register Pin	7-Segment Pin	7-Segment Letter
15	11	A
1	7	B
2	4	C
3	2	D
4	1	E
5	10	F
6	5	G

Arduino Pin	7-Segment Pin	Controls Digit
10	12	Digit 1
11	9	Digit 2
12	8	Digit 3
13	6	Digit 4



Summary

- In this project you learnt:
    - How a shift register works
    - How to use a shift register to control a 4 digit seven segment display
    - How to use the shiftOut() function