

Eight LEDs and a Shift Register

Overview



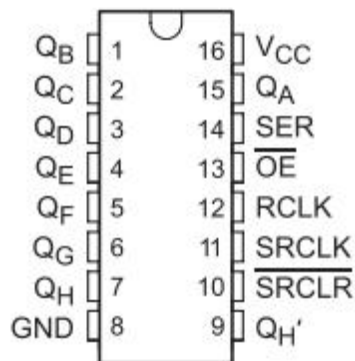
In this lesson, you will learn how to use eight large red LEDs with an Arduino without needing to give up 8 output pins!

Specification

Please view 74HC595-datasheet.pdf






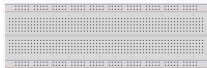

Path: \Public_materials\Datasheet\74HC595-datasheet.pdf

Pin definition

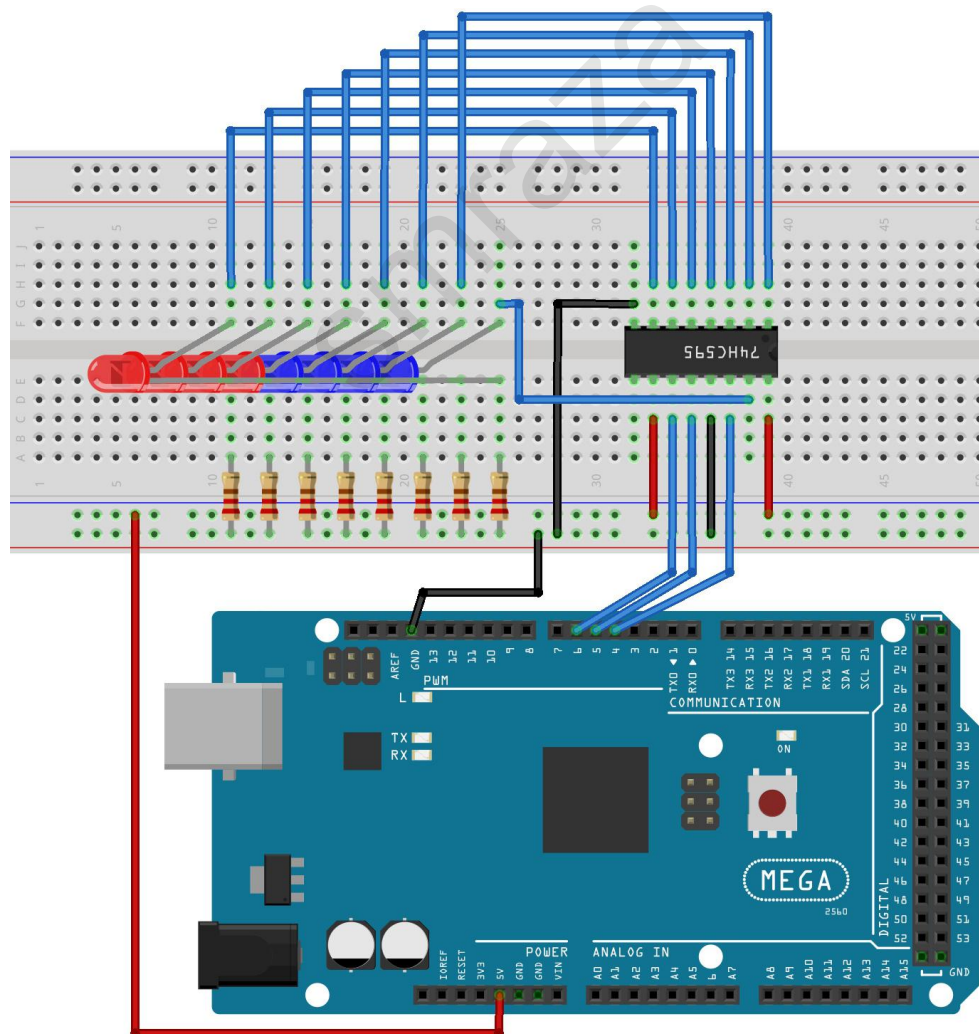


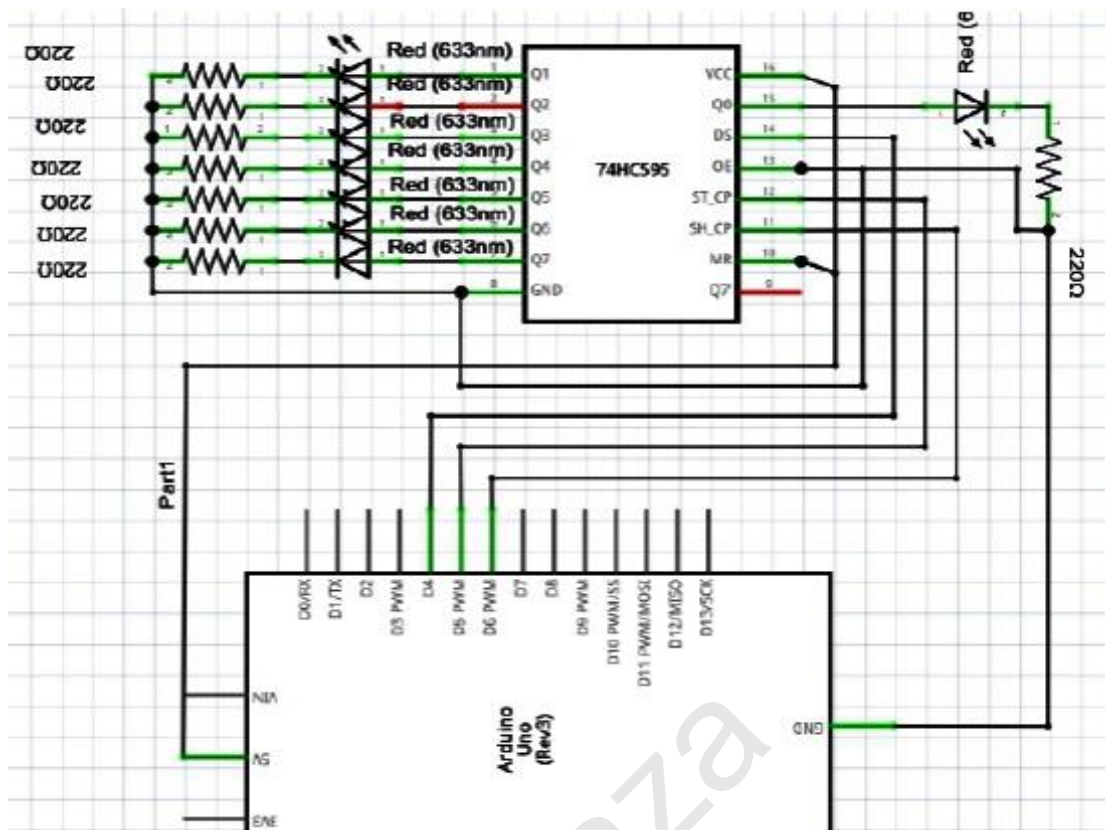
GND	8	10	—	Ground Pin
OE	13	17	I	Output Enable
Q _A	15	19	O	Q _A Output
Q _B	1	2	O	Q _B Output
Q _C	2	3	O	Q _C Output
Q _D	3	4	O	Q _D Output
Q _E	4	5	O	Q _E Output
Q _F	5	7	O	Q _F Output
Q _G	6	8	O	Q _G Output
Q _H	7	9	O	Q _H Output
Q _{H'}	9	12	O	Q _{H'} Output
RCLK	12	14	I	RCLK Input
SER	14	18	I	SER Input
SRCLK	11	14	I	SRCLK Input
SRCLR	10	13	I	SRCLR Input
NC	—	1	—	No Connection
		16		
		11		
		16		
V _{CC}	—	20	—	Power Pin

Hardware required

Material diagram	Material name	Number
	74HC595	1
	LED	8
	220/330Ω resistor	8
	USB Cable	1
	MEGA 2560	1
	Breadboard	1
	Jumper wires	Several

Connection diagram





Connection:

Q1 -> LED1	VCC->VCC
Q2 -> LED2	Q0->LED8
Q3 -> LED3	DS->D4
Q4 -> LED4	OE->GND
Q5 -> LED5	ST_CP->D5
Q6 -> LED6	SH_CP->D6
Q7 -> LED7	MR->VCC
GND -> GND	Q7->null

Note :

Pay attention to the direction of 74HC595.

Sample code

Note: sample code under the **Sample code** folder

```
int latchPin = 5;
int clockPin = 6;
int dataPin = 4;
byte leds = 0;
void setup()
{
    pinMode(latchPin, OUTPUT);
    pinMode(dataPin, OUTPUT);
    pinMode(clockPin, OUTPUT);
}
void loop()
{
    leds = 0;
    updateShiftRegister();
    delay(500);
    for (int i = 0; i < 8; i++)
    {
        bitSet(leds, i);
        updateShiftRegister();
        delay(500);
    }
}
void updateShiftRegister()
{
    digitalWrite(latchPin, LOW);
    shiftOut(dataPin, clockPin, LSBFIRST, leds);
    digitalWrite(latchPin, HIGH);
}
```

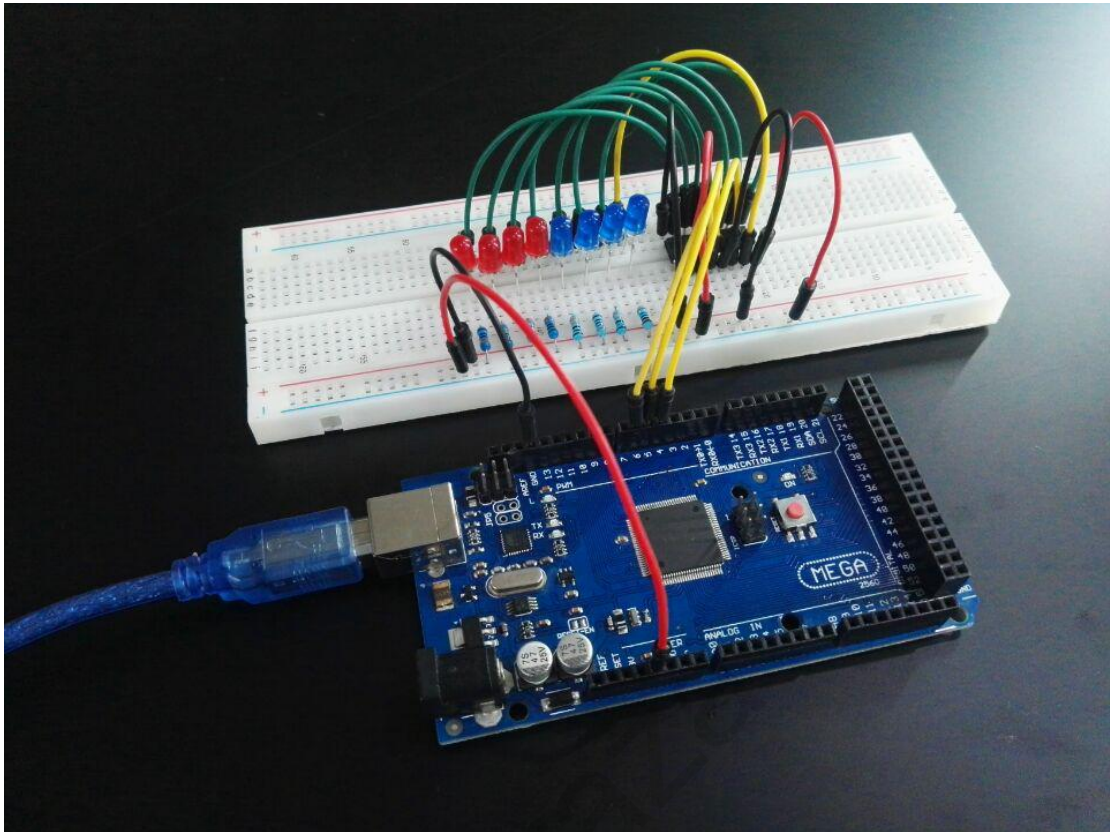
/*

The function 'updateShiftRegister', first of all sets the latchPin to low, then calls the Arduino function 'shiftOut' before putting the 'latchPin' high again. This takes four parameters, the first two are the pins to use for Data and Clock respectively. The third parameter specifies which end of the data you want to start at. We are going to start with the right most bit, which is referred to as the 'Least Significant Bit' (LSB). The last parameter is the actual data to be shifted into the shift register, which in this case is 'leds'.

If you wanted to turn one of the LEDs off rather than on, you would call a similar Arduino function (bitClear) on the 'leds' variable. This will set that bit of 'leds' to be 0 and you would then just need to follow it with a call to 'updateShiftRegister' to update the actual LEDs.

*/

Example picture



Language reference

[byte](#)

Application effect

3 LED ports can be used to control the eight IO.
You will see all the LEDs turn on or turn off regularly.

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