

LAB REPORT-6

Name: K.Lakshmi Nirmala

Roll Number: 2021101126

Group number: G6.

PART-1

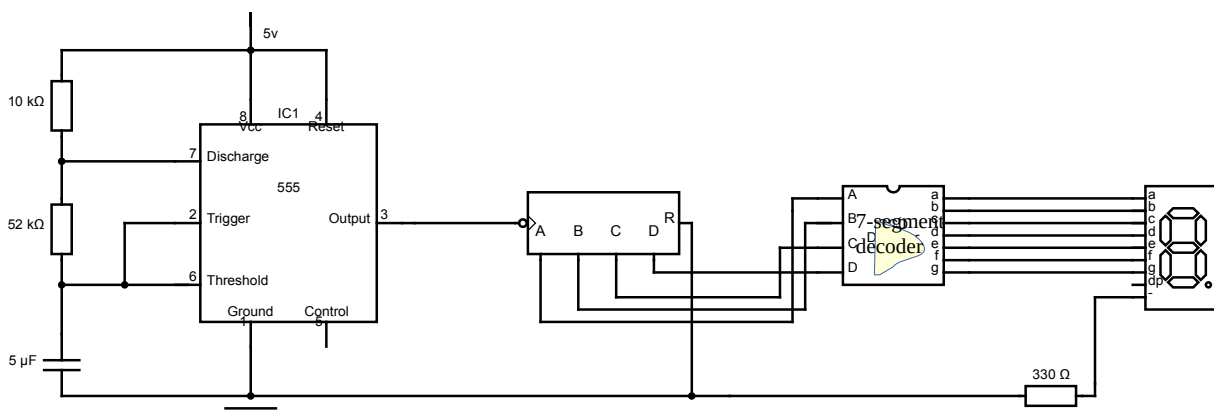
Aim/Objective of the experiment:

Build a circuit for a decade counter and understand its usage.

Electronic Components used:

- 1) Breadboard
- 2) Resistors
- 3) Capacitor
- 4) LED s
- 5) 4-Bit Binary Counter(74HC93)
- 6) 7-segement decoder(74HC21)
- 8) Cathode 7-Segment display(CD4511)
- 9) Power supply
- 10) Dual input AND gate(74HC21)

Reference circuit:



Procedure:

- 1) Take the breadboard and place the 555 timer ic on the breadboard.
- 2) Give connections to the timer ic as shown in the above reference circuit.
- 3) Now take 4-Bit binary counter and give output of the timer to the clock0 of the 4-bit binary counter.
- 4) And then give Vcc and Gnd connections from the breadboard to the 4-Bit binary counter.
- 5) Give outputs of the 4-bit binary counter to the inputs of the 7 segment decoder.
- 6) Now give the outputs of the 7-segment decoder outputs to the inputs of the 7 segment display as shown in the reference circuit diagram.
- 7) Now start the simulation and observe the outputs of the 7 segment display.

Conclusion:

- 1) Above circuit gives the output from 0 to 15 and 7 segment display the number from 0 to 9 and rest it became blank.
- 2) From this experiment I understood how decade counter works and its usage.
- 3) And know about the 7 segment display which is frequently used in lifts and lockers etc
- 4) Below table outputs continues until we stop the simulation

Outputs of the circuit				Decimal
0	1	2	3	0-15
0	0	0	0	0
0	0	0	1	1
0	0	1	0	2
0	0	1	1	3
0	1	0	0	4
0	1	0	1	5
0	1	1	0	6
0	1	1	1	7
1	0	0	0	8
1	0	0	1	9
1	0	1	0	10(Not display)
1	0	1	1	11(Not display)
1	1	0	0	12(Not display)
1	1	0	1	13(Not display)
1	1	1	0	14(Not display)
1	1	1	1	15(Not display)

Link for the Tinkercad Simulation:

https://www.tinkercad.com/things/ekJkpmU4unH-lab-6-part-a/editel?sharecode=vbeBTdTdbB-gSYS7Hd9BQQ3NfNo_YkBKsfUNP6LEwVM

PART-2

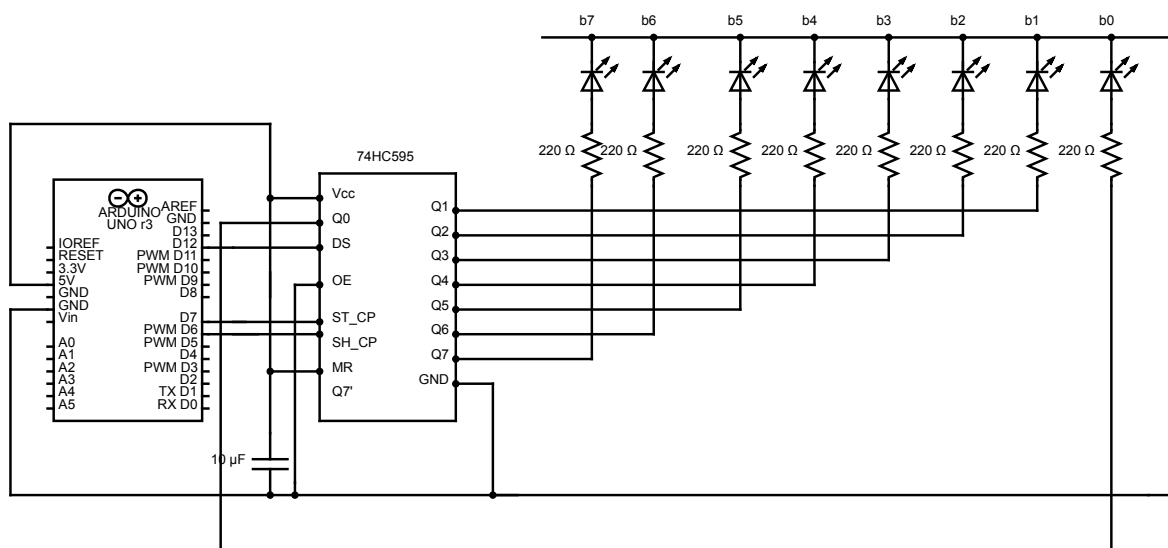
Aim/Objective of the experiment:

To build a circuit for shift register and understand its usage by giving the inputs from the code by default and user entered through serial monitor.

Electronic Components used:

- 1) Breadboard
- 2) Arduino UNO R3
- 3) Capacitor
- 4) 8-LEDs
- 5) 8-Resistors
- 6) 74HC595 IC (8-bit shift register)
- 7) Wires

Reference Circuit:



Procedure:

- 1)Take the breadboard and arduino.
- 2)Place 74HC595 IC on the breadboard, Now give vcc and gnd connections to the breadboard and ic from arduino.
- 3)Now arrange the circuit as shown in the above reference circuit diagram.
- 4)Now write the code in the code sections to count 0 to 255.

Part-A code:

```
int latchpin=7;
int clockpin=6;
int datapin=13;
void setup()
{
    pinMode(datapin,OUTPUT);
    pinMode(latchpin,OUTPUT);
    pinMode(clockpin,OUTPUT);
}
void loop()
{
    for(int i=0;i<=255;i++)
    {
        digitalWrite(latchpin,LOW);
```

```

    shiftOut(datapin,clockpin,MSBFIRST,i);
    digitalWrite(latchpin,HIGH);
    delay(500);
}
}

```

This is the code for part-a to glow leds from 0 to 255 untill we stop simulation.

Part-b Code;

```

int latchpin=7;
int clockpin=6;
int datapin=13;
int value;
void setup()
{
    Serial.begin(9600);
    pinMode(datapin,OUTPUT);
    pinMode(latchpin,OUTPUT);
    pinMode(clockpin,OUTPUT);
}
void loop()
{
    if(Serial.available())
    {

```

```

value = Serial.read()-'0';
Serial.print("Give Input value: ");
Serial.println(value);
}
int i,j=0;
for(i=0;i<=value;i++)
{
    if(i==0)
        (j=1);
    else j=j*2;
    if(i==value)
    {
        digitalWrite(latchpin,HIGH);
        shiftOut(datapin,clockpin,MSBFIRST,j);
        digitalWrite(latchpin,LOW);
        delay(0);
    }
}
}

```

This code is to take input from the user from 0 to 7 and glow corresponding led.

Conclusion:

1) From this experiment we understood about how to use shift register, how it works and its usage.

2) Part-A conclusion:

Shift register gives the output 0 to 255 through LEDs as significant bits (Binary code) until we stop simulation.

3) Part-b conclusion:

When we give the number from 0 to 7, Shift register makes the LED glow corresponding to that number.

Link for the Tinkercad Simulation:

Part-a:

https://www.tinkercad.com/things/fyuZTLjAUTL-copy-of-lab-6-part-b/editel?sharecode=wpGxL30qtnKSNpFnYqPA7QJbVpcYcX_0Xi67imT2RxQ

Part-b:

<https://www.tinkercad.com/things/8y7xdn1BhmR-dazzling-tumelo/editel?sharecode=-K2TobbqwjgMxhp4-3ApLLWVOopufAnDLctdFQ0uwhw>