LAB REPORT: 6

NAME: ARYA PRAVIN MARA

ROLL NO: 2021102021

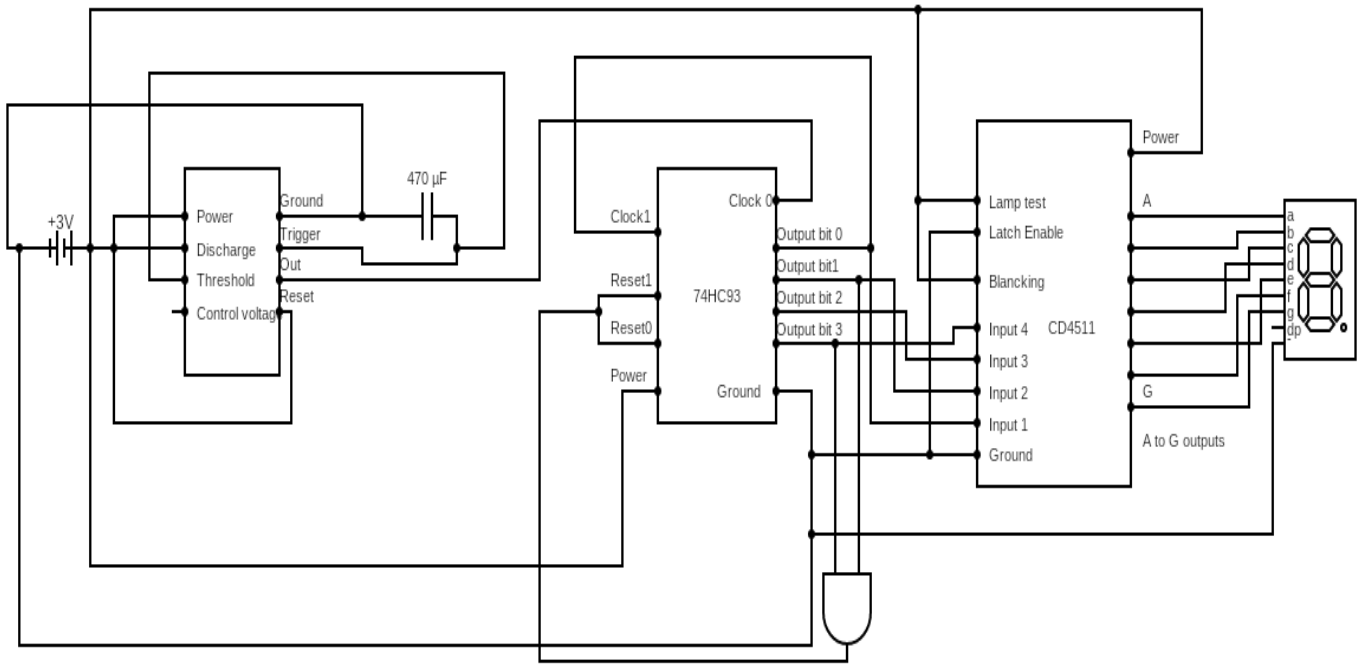
GROUP NO: 3

PART 1: 7-SEGMENT DISPLAY

AIM: To build a circuit for a decade counter and understand its usage. In this experiment, we need to make a sequential circuit that counts from 0 to 9 and then resets back to 0 and so on.

Electronic components used: Clock, Battery, Breadboard, IC CD4511, IC 74HC93, wire, LED, resistors.

Reference circuit:



Procedure:

1. We have to connect a timer 555 which produces a regular clock pulse which acts as input for 4-bit binary ripple counter.
2. 4-bit binary ripple counter which is made with IC CD 4511, gives a count from 0 to 9 on application of the clock cycle. The output which it gives is int form of 4 bits, each representing each bit of the number.
3. This output is then given as input to a seven segment 748C93. This IC decodes the binary output to decimal to be displayed on the seven-segment display.

1) TIMER

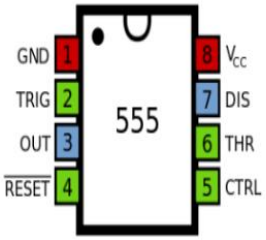


Fig: Pinout of timer

2) IC CD4511

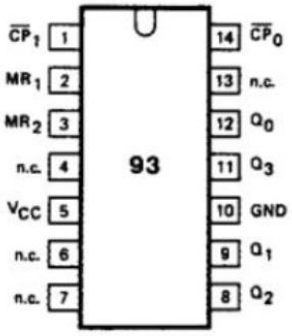


Fig: Pinout of 74HC93

3) IC 748C93.

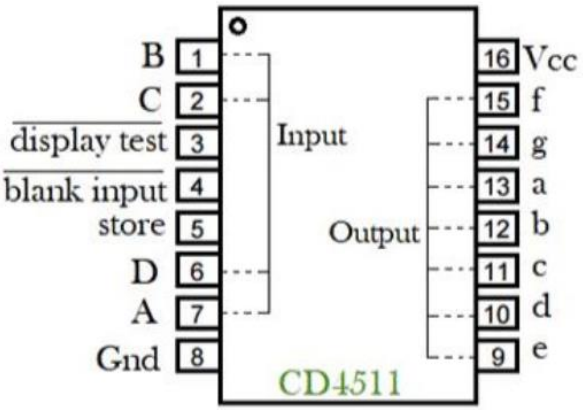


Fig: Pinout of CD4511 IC

Conclusion:

We have made a decade counter that counts from zero to 9 and then resets back to zero and so on and we have not used an Arduino and just a power supply thus we have made a 7-segment decoder using a timer a four-bit binary ripple counter and a BCD (binarycoded decimal) to 7 segment decoder.

Binary ripple counts as:

0000

0001

0010

0011

0100

0101

0110

0111

1000

1001 and again it will start from 0000....

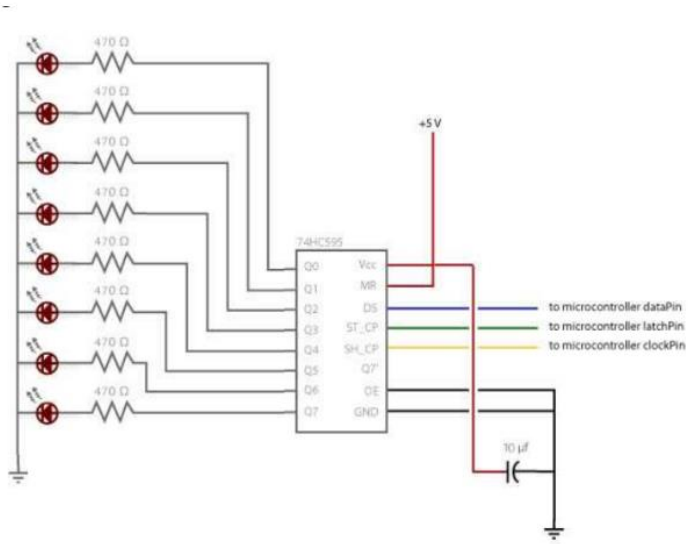
TINKERCAD link: https://www.tinkercad.com/things/hDAykTAfQyc

PART 2.1: Count from 0 to 255

AIM: To build a circuit from shift register and count from 0 to 255 and glow the 8 LEDs in order.

Electronic components used: Wire, Arduino, Led's, resistor, 74HC595 shift register.

Reference circuit:



Procedure:

In this experiment we are going to use 74HC595 as an "8-bit serial-in, a serial or parallel-out shift registers with output latches; 3-state." In other words, we can use it to control 8 outputs at a time while only taking up a few pins on your microcontroller. We must Give 3 inputs to the 74HC595 IC from the Arduino and other necessary inputs to drive the IC and then Connect the output pins of the IC to 8 LEDs.

Conclusion: We have built a circuit from shift register that counts from 0 to 255 and glows the 8 LEDs in order of the binary representation of their respective numbers.

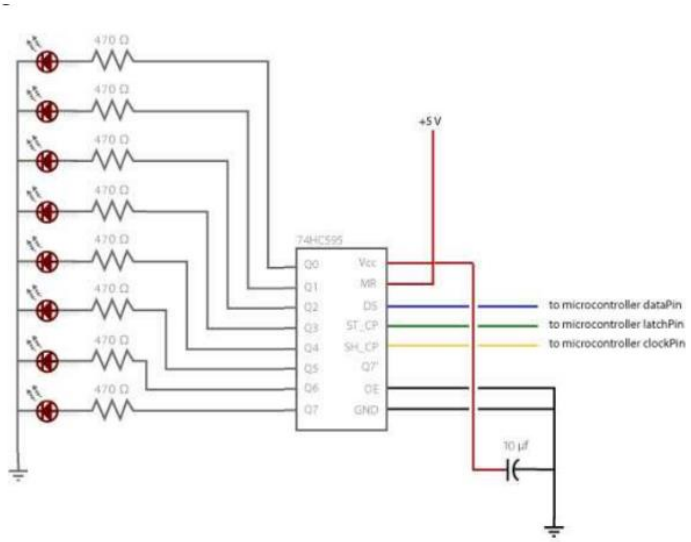
TINKERCAD link: https://www.tinkercad.com/things/8C1rFli2Wiw

PART 2.2

AIM: To build a circuit from shift register and to glow the Leds of the number that is input.

Electronic components used: Wire, Arduino, Led's, resistor, 74HC595 shift resistor.

Reference circuit:



Procedure:

In this experiment we are going to use 74HC595 as an "8-bit serial-in, a serial or parallel-out shift register with output latches; 3-state." In other words, we can use it to control 8 outputs at a time while only taking up a few pins on your microcontroller. We must Give 3 inputs to the 74HC595 IC from the Arduino and other necessary inputs to drive the IC and then Connect the output pins of the IC to 8 LEDs

Conclusion: We have built a circuit from shift register that glow led corresponding to the binary number that we input.

TINKERCAD Link: https://www.tinkercad.com/things/dYRcTkzxbF3