

NAME : YANA SRIVASTAVA

SECTION : 23 “B”

UID : 20BCS 2279

SUBJECT : DIGITAL ELECTRONICS

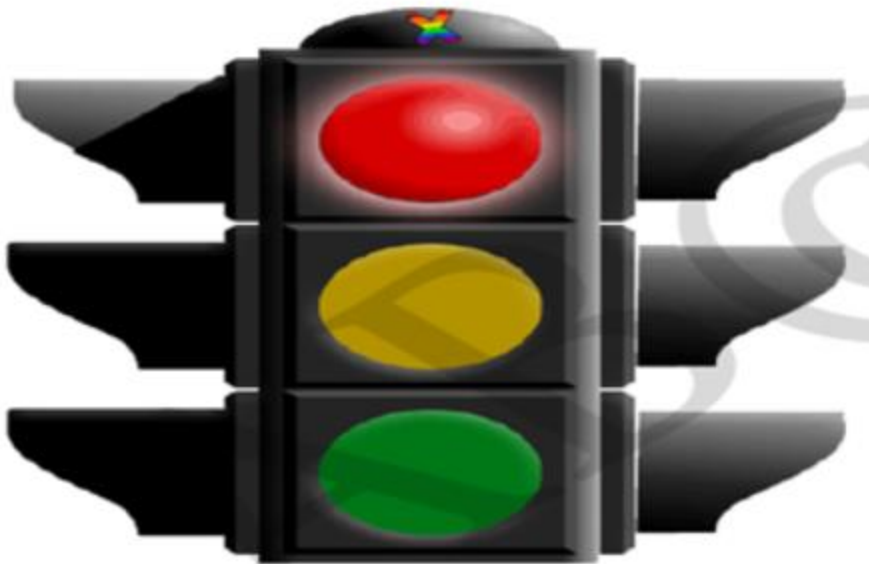
AIM :

Design traffic lights using D Flipflop.

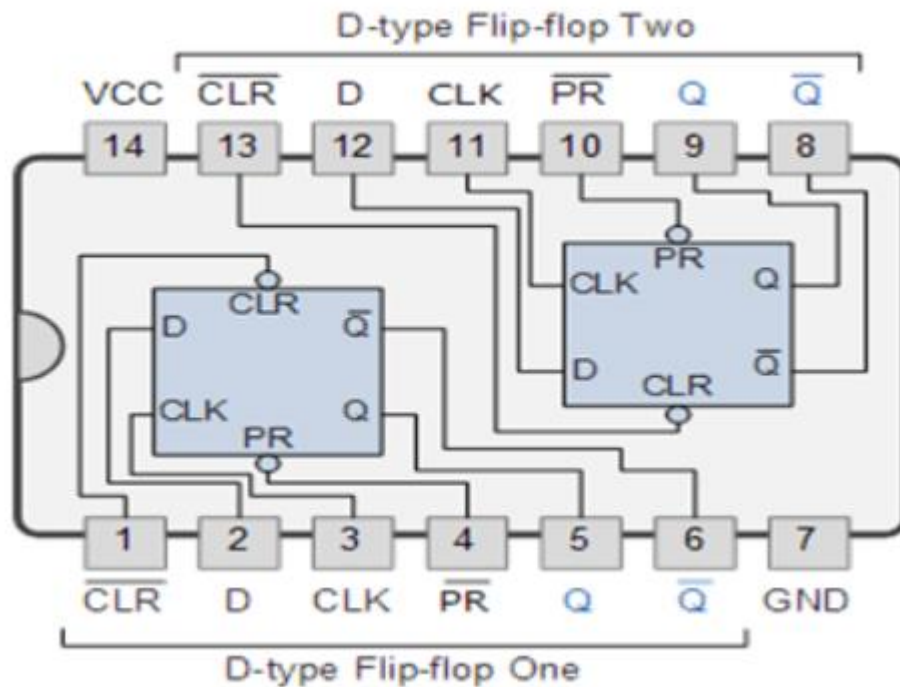
APPARATUS REQUIRED :

- (i) 555 timer IC (NE555)
- (ii) D flip flop IC (7474)
- (iii) 5V Power Supply
- (iv) Breadboard
- (v) Connecting wires
- (vi) Tinkercad
- (vii) Simulator.

DESIGN :

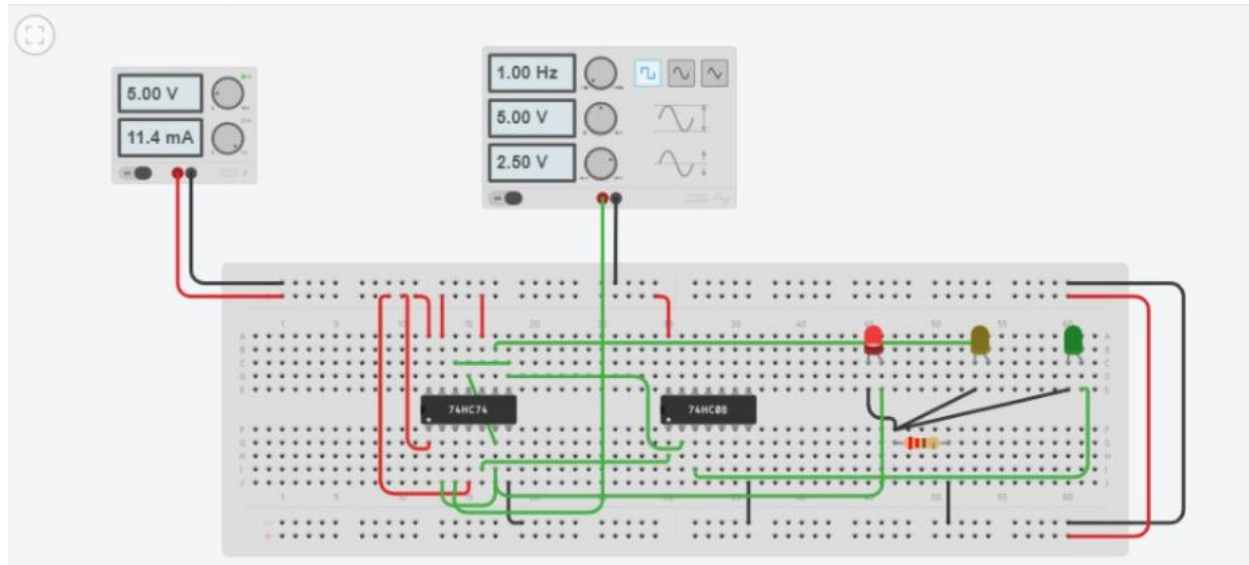


Pictorial representation

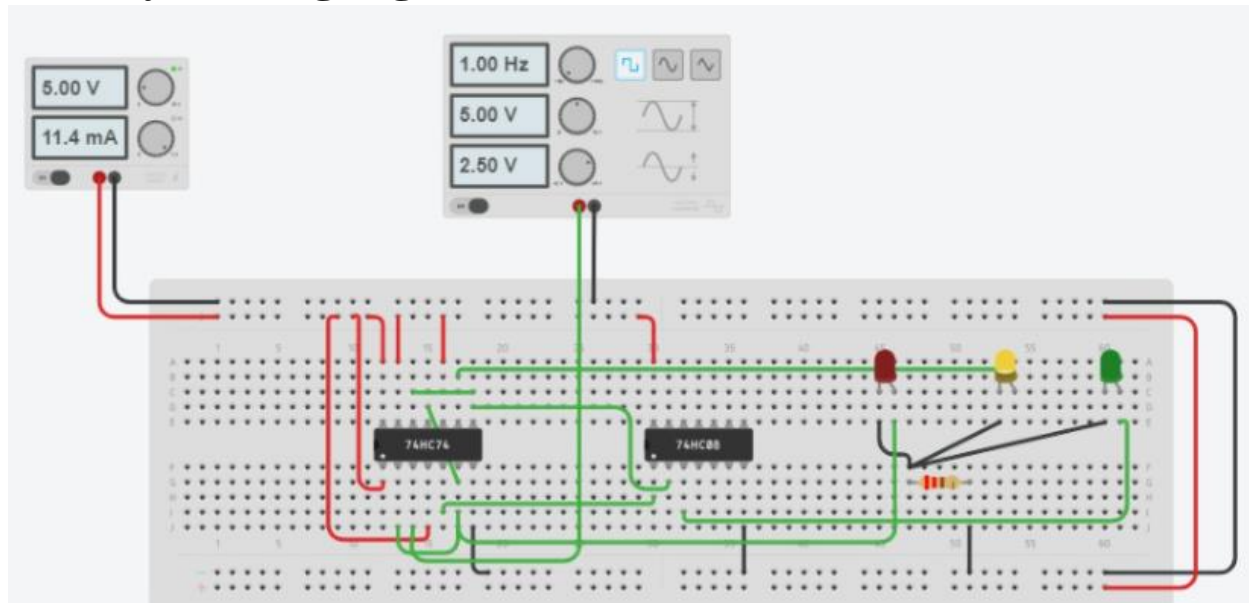


CIRCUIT DIAGRAM AND WORKING :

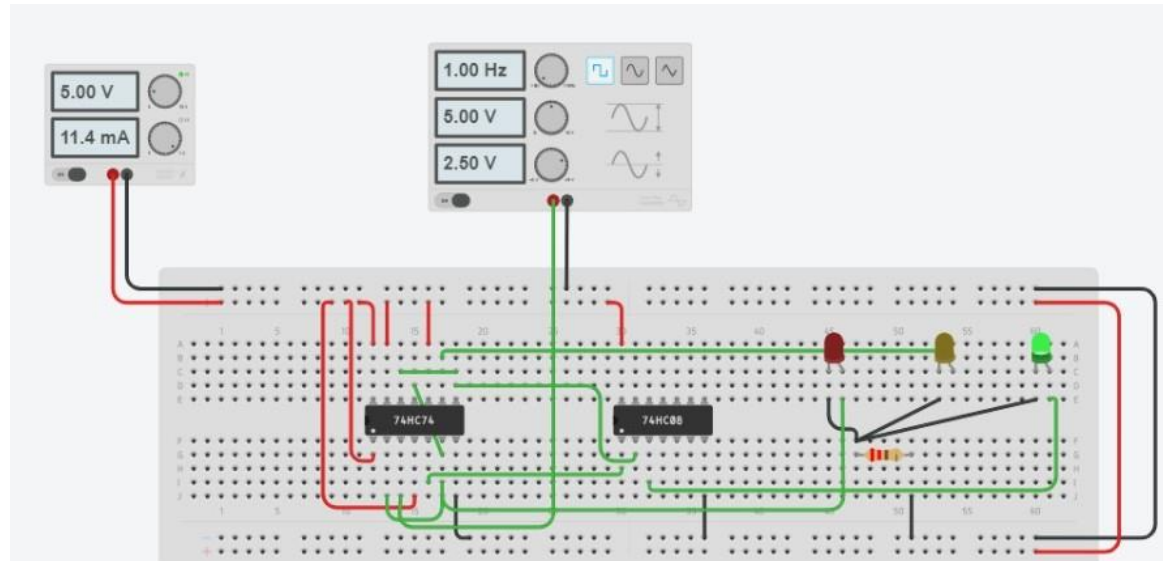
(i) When red light glows :



(ii) When yellow light glows :



(iii) When green light glows:



RESULT :

At the first positive edge trigger give input as 0 to flip flop 1 so the output is also 0 and the output at Q' which is 1 will act as a positive edge trigger at flip flop 2 which will again give input as 0 to Q of flip flop 2 so the output is also 0 and the output at Q' of flip flop 2 which is 1 will turn ON the red led connected to it.

After first positive edge:

Input at flip flop 1 is 1 (equal to Q' of flip flop 1)

Input at flip flop 2 is 1

At the second positive edge:

At flip flop 1 the input 1 is given to output Q which is connected to yellow LED and Q' turns 0 giving the clock at flip flop 2 a 0, turning the red led OFF.

After second positive edge

Input at flip flop 1 is 0 (equal to Q' of flip flop 1)

Input at flip flop 2 is 1

At the third positive edge at flip flop 1 the input which is 0 is given to the output which is also made 0 and the output at Q' which is 1 will act as a positive edge trigger at flip flop 2 which will again give input as 1 to Q of flip flop 2. Now Q of flip flop 2 and Q' of flip flop 1 which are both at 1 will give 1 to the yellow LED turning it on.

And the loop will continue.

Now once led glows make sure that the next positive edge trigger will come after the required time. Change the frequency of clock pulse according to the requirement (Use 555 timer to generate required clock pulse) so that LED will stays glowing and after that particular time give 1 as Input at positive edge of the clock the other LED glows and maintain the same clock frequency.

TROUBLESHOOTING :

No problem occurs.