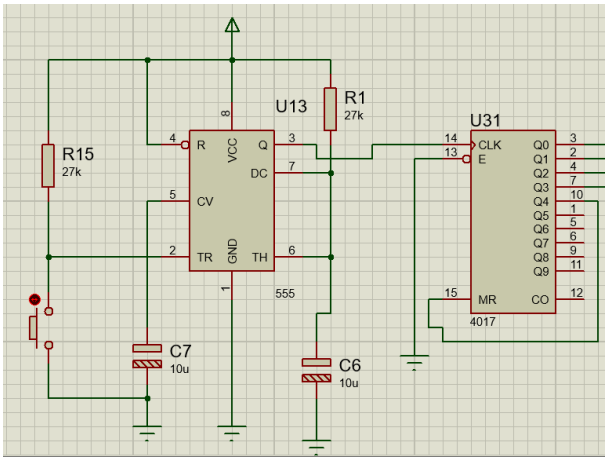
Density Traffic Light

Purpose: This project aims to create a traffic light system that works based on vehicle density. It gives priority to the road with more vehicles.

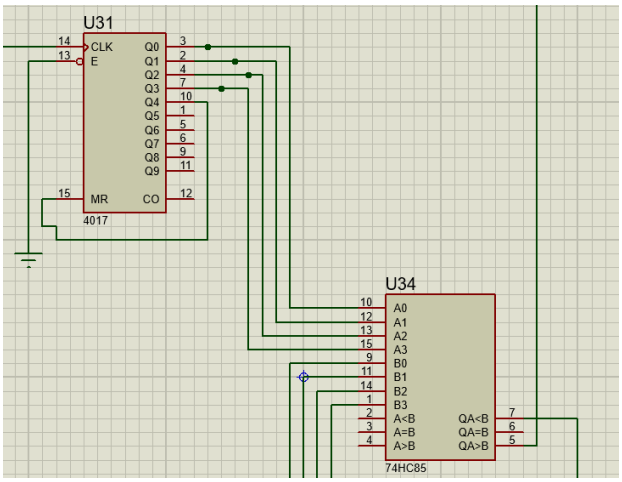
Material: 2xCD4017(decade counter)/2xCD4511(7segmentdecoder) 5x555TLC(timer) /1x74HC85(comparator)/2x74AC08(And Gate) 3x74AC32(Or Gate)/2xCD4013(D Flip Flop)/Some Value Resistance

How it works:

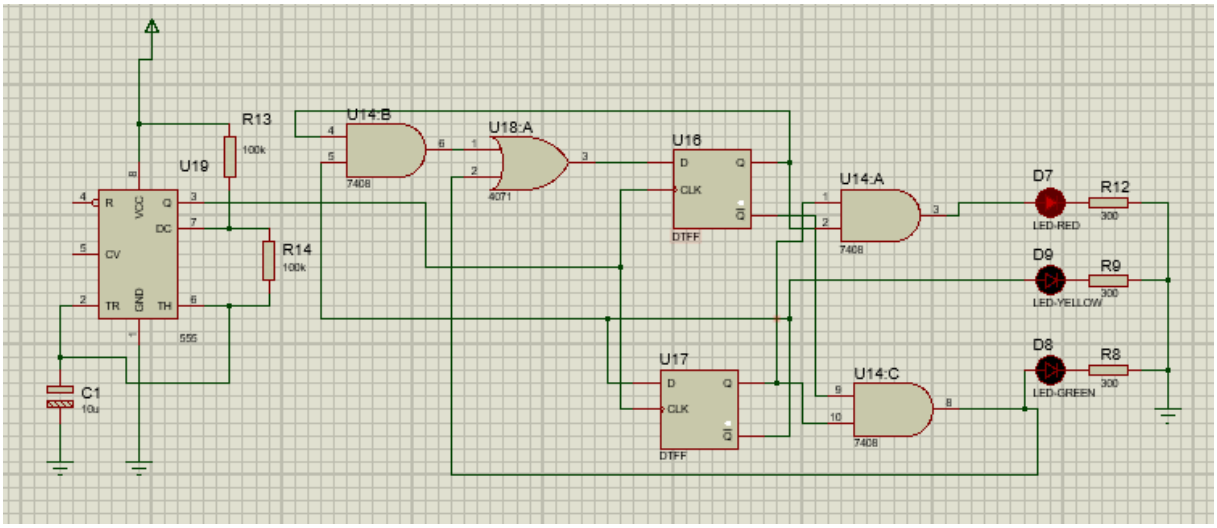
- Buttons are used to count the vehicles on each road.
- The 555 timer (monostable mode) with The CD4017 decade counter registers the number of button presses.



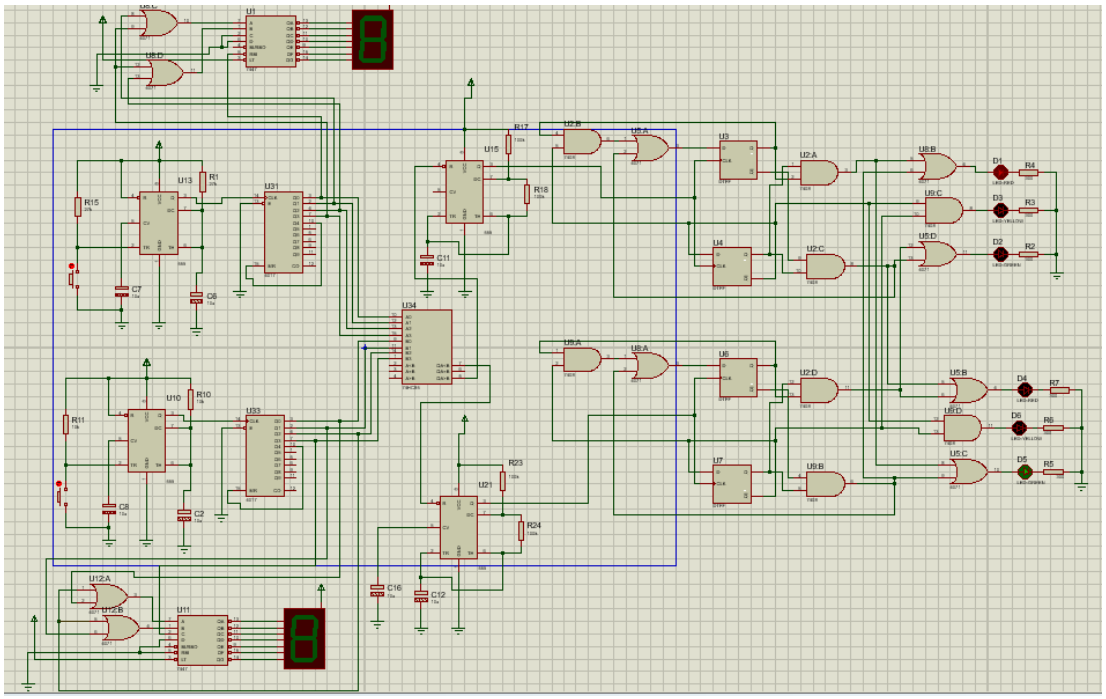
- The CD4017 decade counter stores the vehicle count for two separate roads.
- The outputs from the CD4017 counters are compared using the 74HC85 comparator.
- The comparator determines which road has more vehicles.



- Based on the result, timer (TLC555) activates the traffic light for the busier road.
- D flip-flop (CD4013), AND gates (74AC08) and OR gates (74AC32) control the light switching in a sequential traffic light circuit.



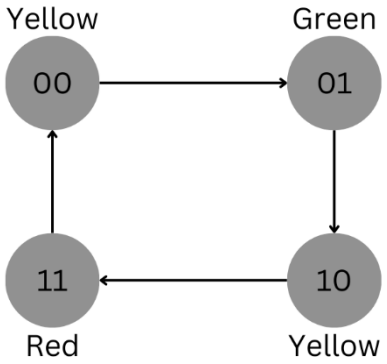
- This system ensures that the road with higher traffic density is active and prioritized with a green light.



Traffic light:

Present Next state D flipflop Outputs

q1	q0	Q1	Q0	D1	D0	R	Y	G
0	0	0	1	0	1	0	1	0
0	1	1	0	1	0	0	0	1
1	0	1	1	1	1	0	1	0
1	1	0	0	0	0	1	0	0



q1 \ q0	0	1
0	0	1
1	1	0

D1=q1q0'+q1'q0

q1 \ q0	0	1
0	0	1
1	1	0

D0=q0'

q1 \ q0	0	1
0	0	1
1	1	0

R=q1q0

q1 \ q0	0	1
0	0	1
1	1	0

Y=q0'

q1 \ q0	0	1
0	0	1
1	1	0

G=q1'q0