DIGITAL LOGIC DESIGN

FINAL PROJECT REPORT

4 WAY TRAFFIC SIGNAL

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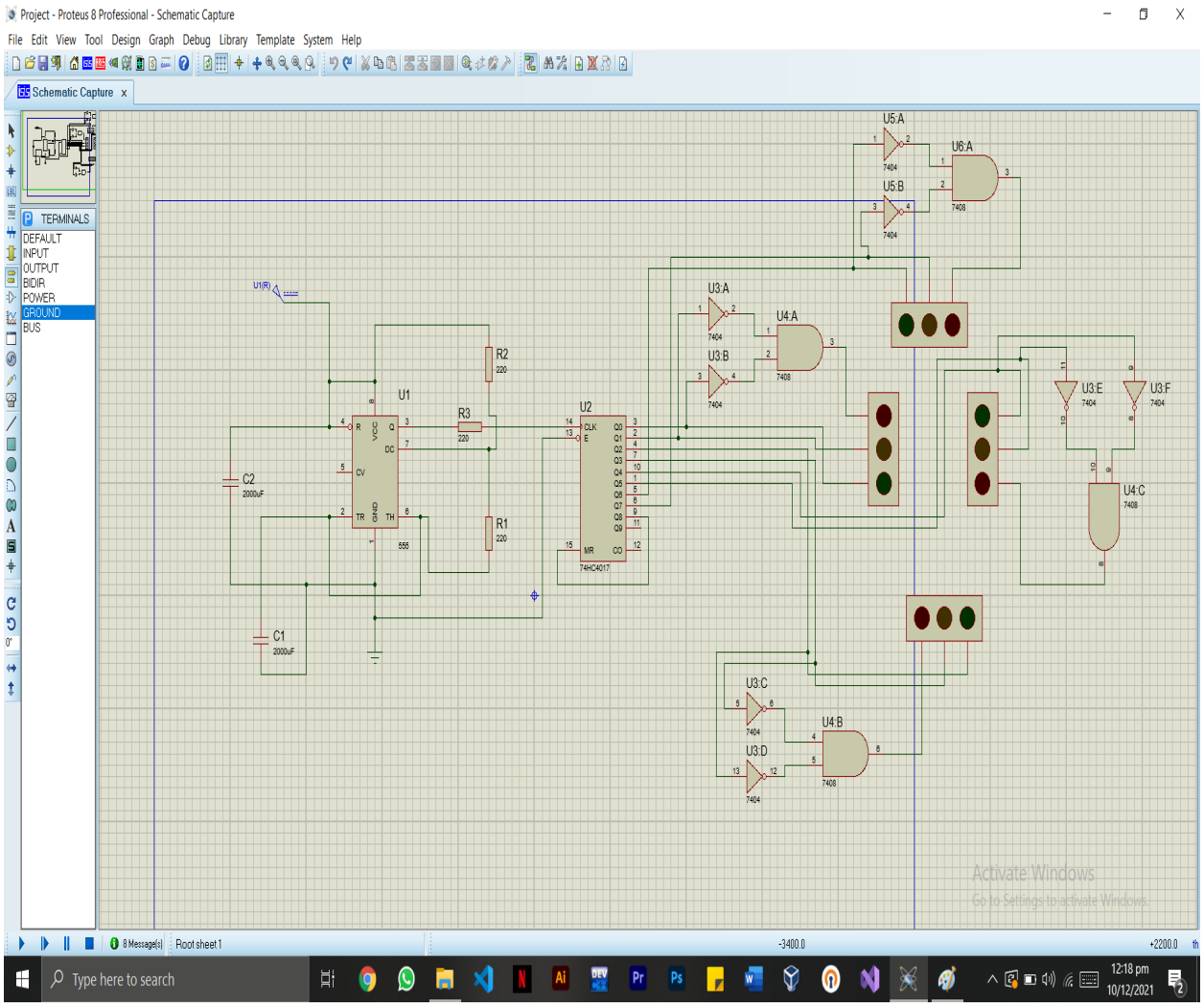
PROTEUS IMPLEMENTATION

CIRCUIT ON PROTEUS:

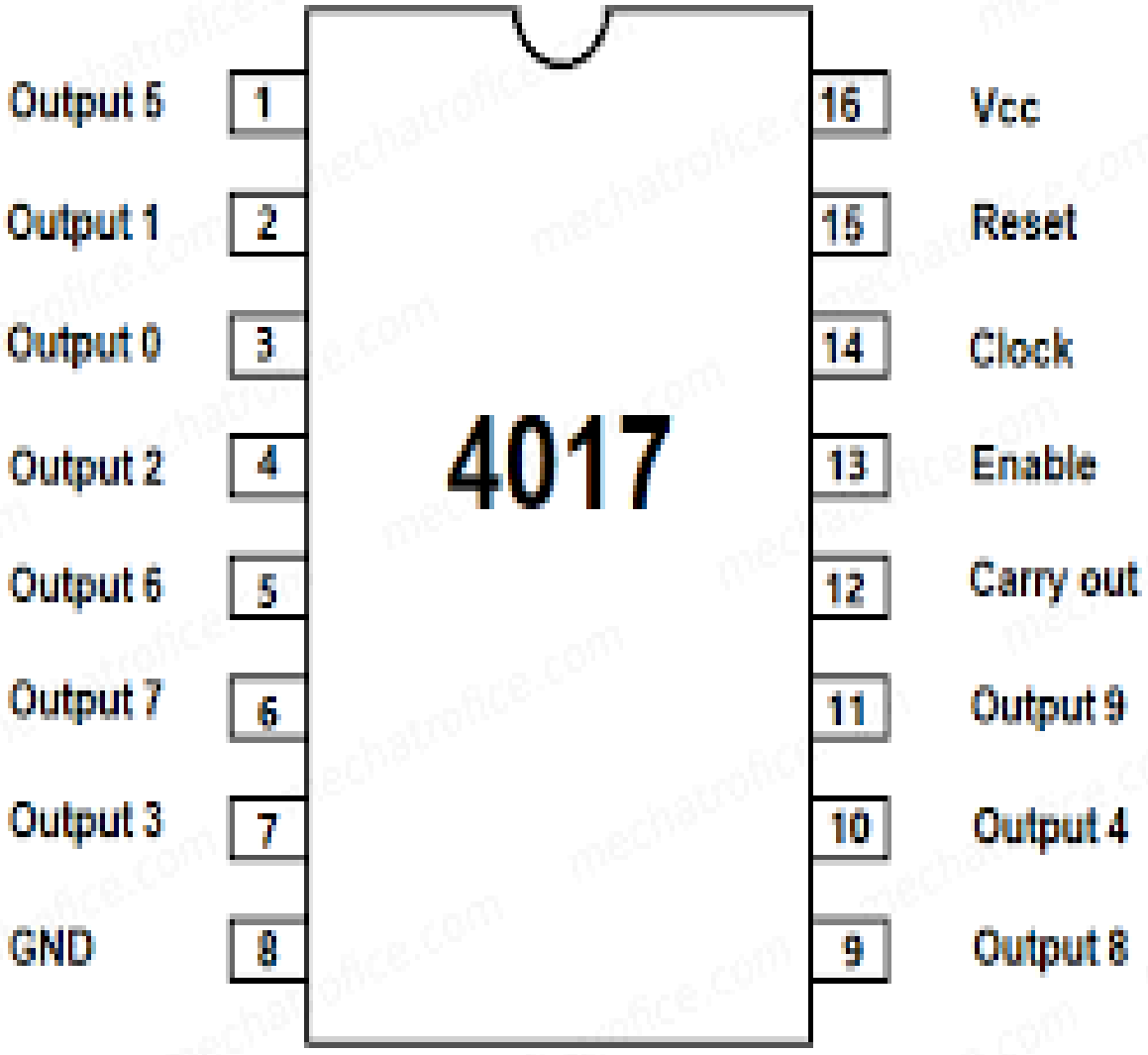


COMPONENTS USED

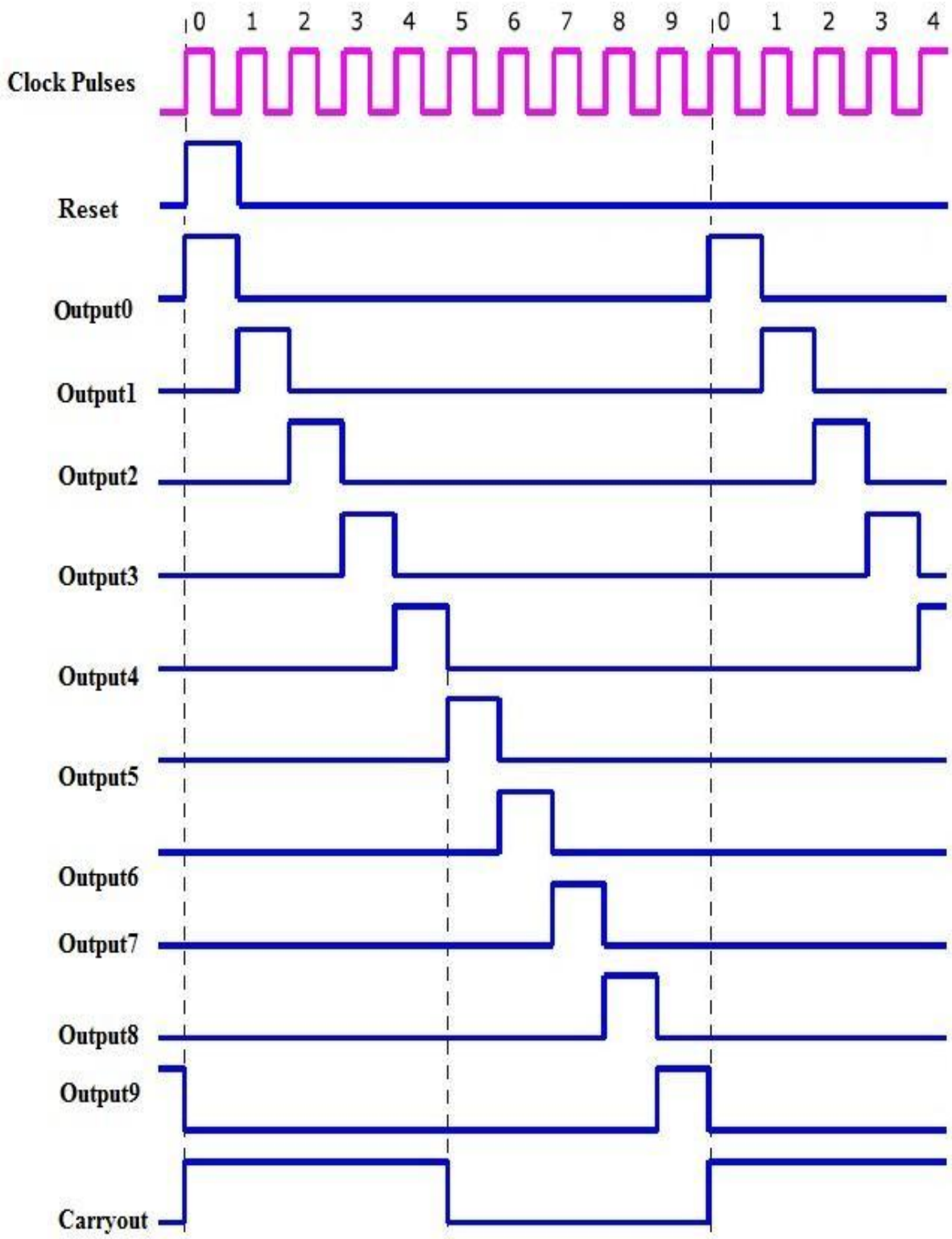
- 4017 IC, BCD decade counter
- Jumper Wires
- NOT gate IC, 7404
- AND gate IC, 7408
- LEDs:
    1. Red (4)
    2. Yellow (4)
    3. Green (4)
- 555 Timer OR clock from trainer board as a pulse generator to BCD decade counter

4017 DECADE COUNTER

PINS CONFIGURATION



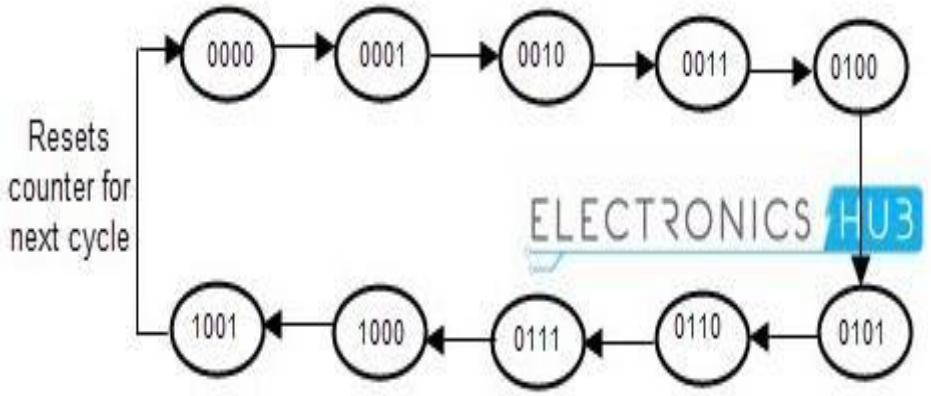
CLOCK WAVEFORM DIAGRAM



After every clock pulse	A	B	C	D
0	0	0	0	0
1	0	0	0	1
2	0	0	1	0
3	0	0	1	1
4	0	1	0	0
5	0	1	0	1
6	0	1	1	0
7	0	1	1	1
8	1	0	0	0

TRUTH TABLE

STATE DIAGRAM



EXPLANATION

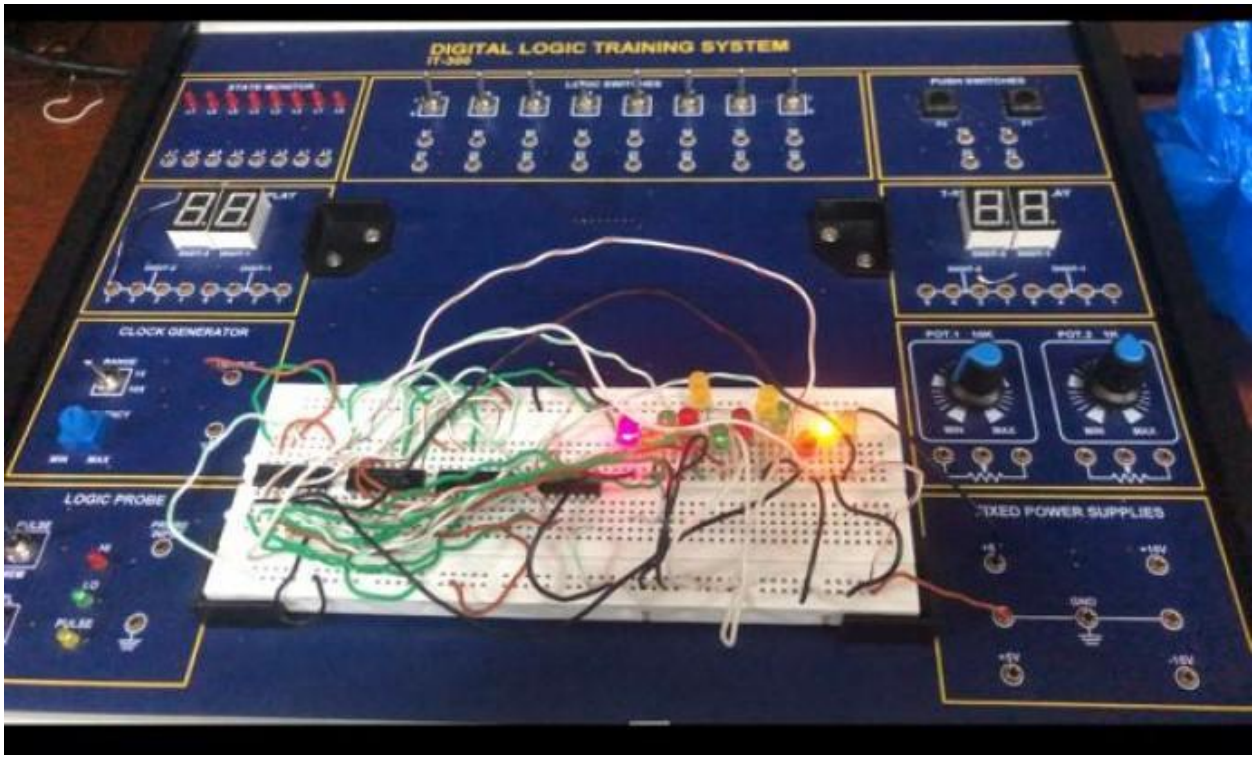
The circuit implementation represents a 4 Way traffic signal system. A 555 timer or a clock generator is used as a pulse generator. When the 4017 bcd decade counter gets a clocked input, every next rising edge of the clock results in 4017 ic decade counter counting to next state, for example state 0000 becomes 0001. In this way 0 to 8 is counted. For each count, a green led turns on, then the next corresponding yellow led and when green light of another side turns on, the previous green and yellow are off resulting in turning on red from 2 NOT gates and 1 AND gate. In this way we get a 4 Way traffic system, when on side is green, all other sides get red. The time for the lights depend on the frequency of pulses generated by the clock.

ASSEMBLING PROCEDURE

- A clock input from a clock generator through a wire to pin 14 of 4017 decade counter
- Pin number 13, Enable is grounded.
- Pin 16 is given voltage
- Pins 3,2,4,7,10,1,5,6,9 are connected to green and yellow leds.

- The input of green and yellow leds are passed into NOT gate and through AND gate to their respective red leds.

HARDWARE PICTURE



REFERENCES

- Reference: https://www.electronicshub.org/decade-counterbcd-counter/