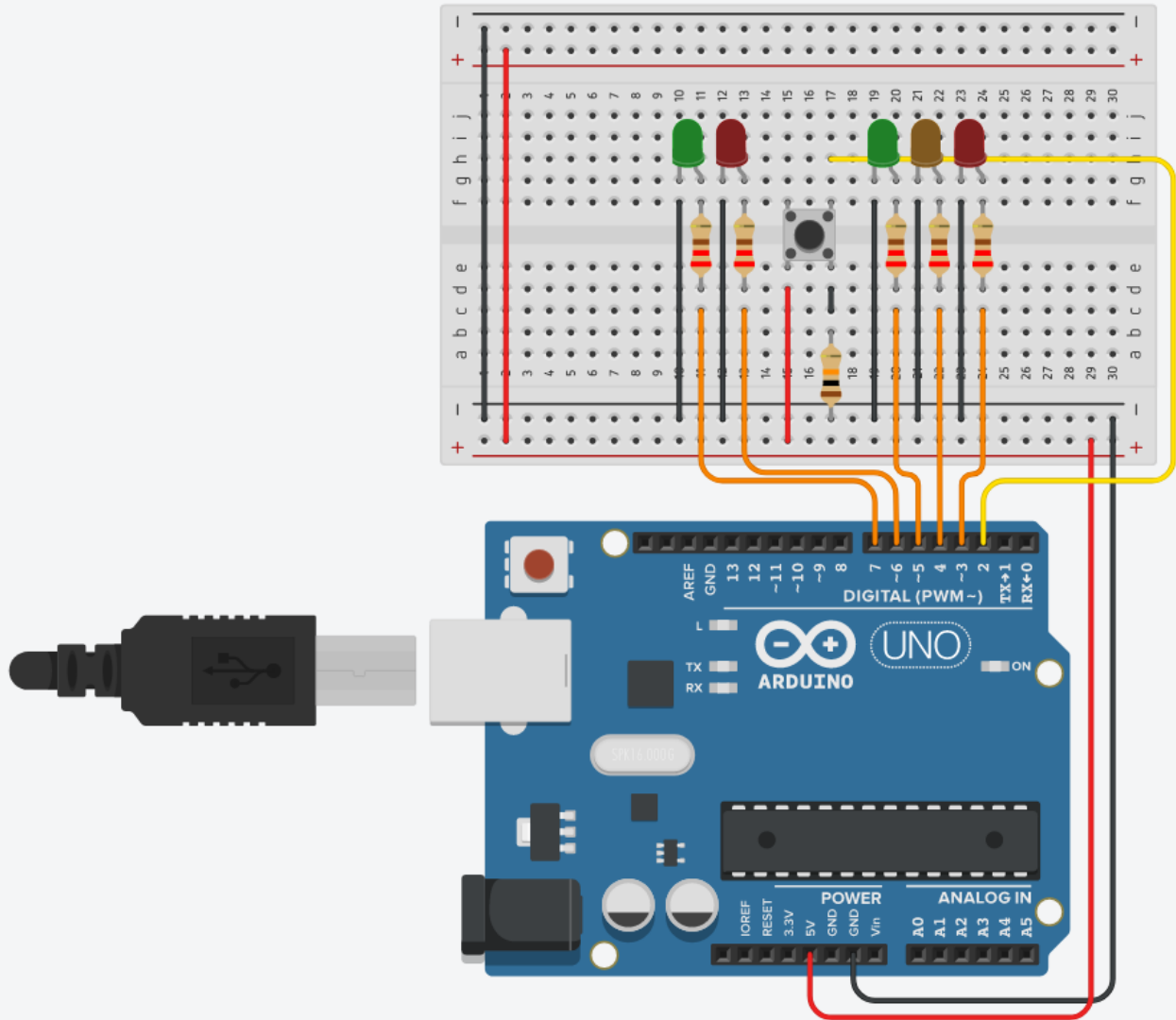# Μικροϋπολογιστές: Εργαστηριακή άσκηση 2

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1 Κύκλωμα

2 Κώδικας

```
const int PL_BUTTON = 2;
const int PL_LED_RED = 6;
const int PL_LED_GREEN = 7;
const int TL_LED_RED = 3;
const int TL_LED_ORANGE = 4;
const int TL_LED_GREEN = 5;

const int NSTATES = 4;

volatile int curstate = 0;

ISR(TIMER1_COMPA_vect)
{
        int btn_state;

        btn_state = digitalRead(PL_BUTTON);
        if (btn_state == HIGH) {
                delay(100);     /* lazy debounce */
                curstate = 1;
        }
}

void
timer_init()
{
        noInterrupts();
        TCCR1A = 0;
        TCCR1B = 0;
        TCNT1 = 0;
        OCR1A = 6249;
        TCCR1B |= (1 << WGM12) | (1 << CS12);
        TIMSK1 |= (1 << OCIE1A);
        interrupts();
}

void
state0()
{
        digitalWrite(PL_LED_RED, HIGH);
        digitalWrite(PL_LED_GREEN, LOW);
        digitalWrite(TL_LED_RED, LOW);
        digitalWrite(TL_LED_ORANGE, LOW);
        digitalWrite(TL_LED_GREEN, HIGH);
        delay(4000);
```

```
}

void
state1()
{
        digitalWrite(PL_LED_RED, HIGH);
        digitalWrite(PL_LED_GREEN, LOW);
        digitalWrite(TL_LED_RED, LOW);
        digitalWrite(TL_LED_ORANGE, HIGH);
        digitalWrite(TL_LED_GREEN, LOW);
        delay(2000);
}

void
state2()
{
        digitalWrite(PL_LED_RED, LOW);
        digitalWrite(PL_LED_GREEN, HIGH);
        digitalWrite(TL_LED_RED, HIGH);
        digitalWrite(TL_LED_ORANGE, LOW);
        digitalWrite(TL_LED_GREEN, LOW);
        delay(4000);
}

void
state3()
{
        digitalWrite(PL_LED_RED, HIGH);
        digitalWrite(PL_LED_GREEN, LOW);
        digitalWrite(TL_LED_RED, HIGH);
        digitalWrite(TL_LED_ORANGE, LOW);
        digitalWrite(TL_LED_GREEN, LOW);
        delay(3000);
}

void
setup()
{
        pinMode(PL_BUTTON, INPUT);
        pinMode(PL_LED_RED, OUTPUT);
        pinMode(PL_LED_GREEN, OUTPUT);
        pinMode(TL_LED_RED, OUTPUT);
        pinMode(TL_LED_ORANGE, OUTPUT);
        pinMode(TL_LED_GREEN, OUTPUT);

        timer_init();
```

```
        Serial.begin(9600);
}

void (*states[NSTATES])() = {
        state0,
        state1,
        state2,
        state3,
};

void
loop()
{
        curstate %= NSTATES;
        (*states[curstate++])();
}
```

3   Πίναχας καταστάσεων

- P_1: Κόκκινο πεζών

- P_2: Πράσινο πεζών

- T_1: Κόκκινο οχημάτων

- T_2: Πορτοκαλί οχημάτων

- T_3: Πράσινο οχημάτων

P_1	P_2	T_1	T_2	T_3
1	0	0	0	1
1	0	0	1	0
0	1	1	0	0
1	0	1	0	0