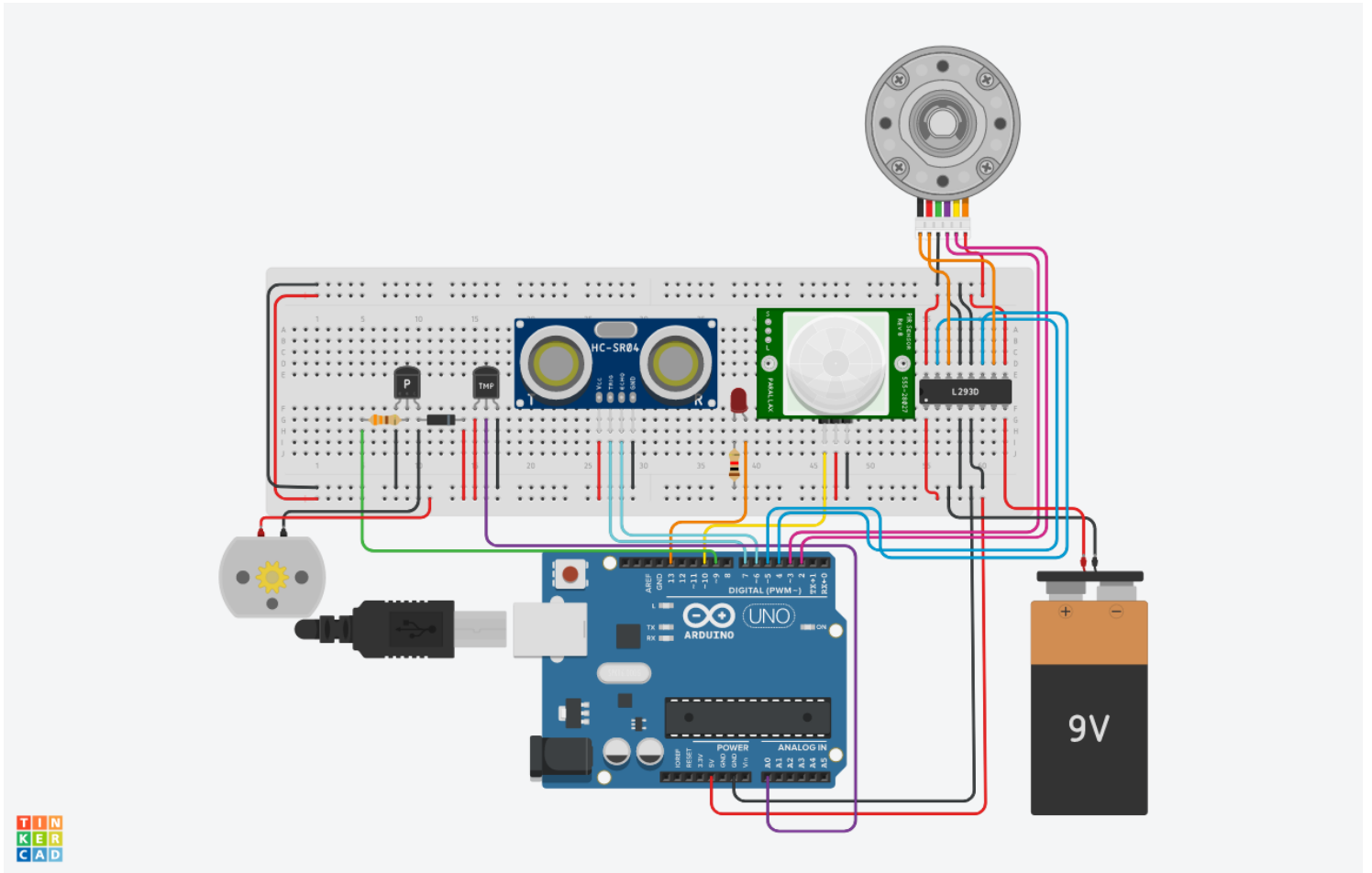# Μικροϋπολογιστές: Εργαστηριακή άσκηση 7

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1 Κύκλωμα

2 Κώδικας

```
#include <Encoder.h>

#define PIN_ENC_CHAN1 2
#define PIN_ENC_CHAN2 3
#define PIN_L293D_IN 4
#define PIN_L293D_OUT 5
#define PIN_ULTRASONIC_ECHO 6
#define PIN_ULTRASONIC_TRIGGER 7
#define PIN_DCMOTOR 9
#define PIN_PIR 10
#define PIN_LED 13
#define PIN_TEMP A0

static Encoder enc(PIN_ENC_CHAN1, PIN_ENC_CHAN2);

void
setup()
{
        pinMode(PIN_ENC_CHAN1, INPUT);
        pinMode(PIN_ENC_CHAN2, INPUT);
        pinMode(PIN_L293D_IN, OUTPUT);
        pinMode(PIN_L293D_OUT, OUTPUT);
        pinMode(PIN_DCMOTOR, OUTPUT);
        pinMode(PIN_PIR, INPUT);
        pinMode(PIN_LED, OUTPUT);
        pinMode(PIN_ULTRASONIC_ECHO, INPUT);
        pinMode(PIN_ULTRASONIC_TRIGGER, OUTPUT);
        Serial.begin(9600);
}


void
loop()
{
        if (measure_distance() <= 40)
                open_door();
        if (measure_temp() > 20)
                fan();
        if (digitalRead(PIN_PIR) == HIGH)
                digitalWrite(PIN_LED, HIGH);
        else
                digitalWrite(PIN_LED, LOW);

        delay(10);
}
```

```c
int
measure_distance()
{
        long duration;
        int distance;

        digitalWrite(PIN_ULTRASONIC_TRIGGER, LOW);
        delayMicroseconds(2);
        digitalWrite(PIN_ULTRASONIC_TRIGGER, HIGH);
        delayMicroseconds(10);
        digitalWrite(PIN_ULTRASONIC_TRIGGER, LOW);

        duration = pulseIn(PIN_ULTRASONIC_ECHO, HIGH);
        distance = (float)duration * 0.344 / 20;

        Serial.print("Distance: ");
        Serial.print(distance);
        Serial.println(" cm");

        delay(100);

        return (distance);
}

void
open_door()
{
        long pos;
        int rot;

        analogWrite(PIN_L293D_IN, 30);
        analogWrite(PIN_L293D_OUT, 0);
        pos = enc.read() / 10;
        rot = abs(pos) / 10;

        Serial.print("Encoder position: ");
        Serial.println(pos);
        Serial.print("Encoder rotation: ");
        Serial.println(rot);
}

float
measure_temp()
{
        float temp;
```

```
        int adc;

        adc = analogRead(PIN_TEMP);
        temp = (float)adc * (5000 / 1024.0);
        temp = (temp - 500) / 10;

        Serial.print("Temperatue: ");
        Serial.print(temp);
        Serial.println(" C");

        delay(100);

        return (temp);
}

void
fan()
{
        int v;

        for (v = 0; v <= 255; v += 5)
                analogWrite(PIN_DCMOTOR, v);
        for (v = 255; v >= 0; v -= 5)
                analogWrite(PIN_DCMOTOR, v);
}
```