

**MISR UNIVERSITY FOR SCIENCE AND TECHNOLOGY**  
**COLLEGE OF ENGINEERING**  
**MECHATRONICS DEPARTMENT**



# **MTE 405 SENSORS AND MEASUREMENTS**

**LAB 6 – SPRING 2019**

## Lab 6

# Goals Of The Lab

Encoder Speed Monitoring



Measuring Servo Motor  
Speed

Lab 6

# Exercise 1

DC Speed Monitoring using Quadrature Encoder



# Exercise Objective



Using XOR for doubling encoder resolution



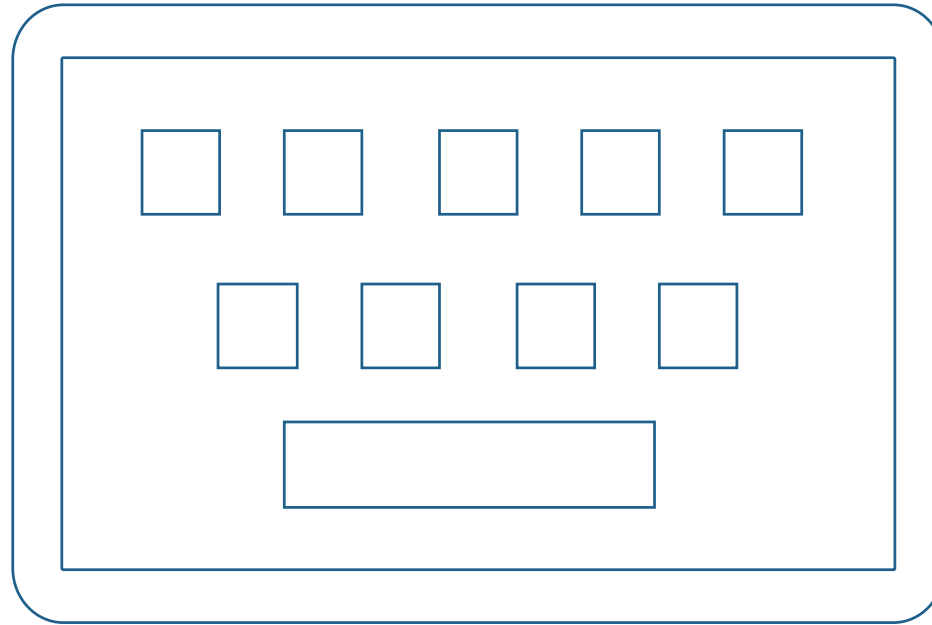
Using Timer One Library



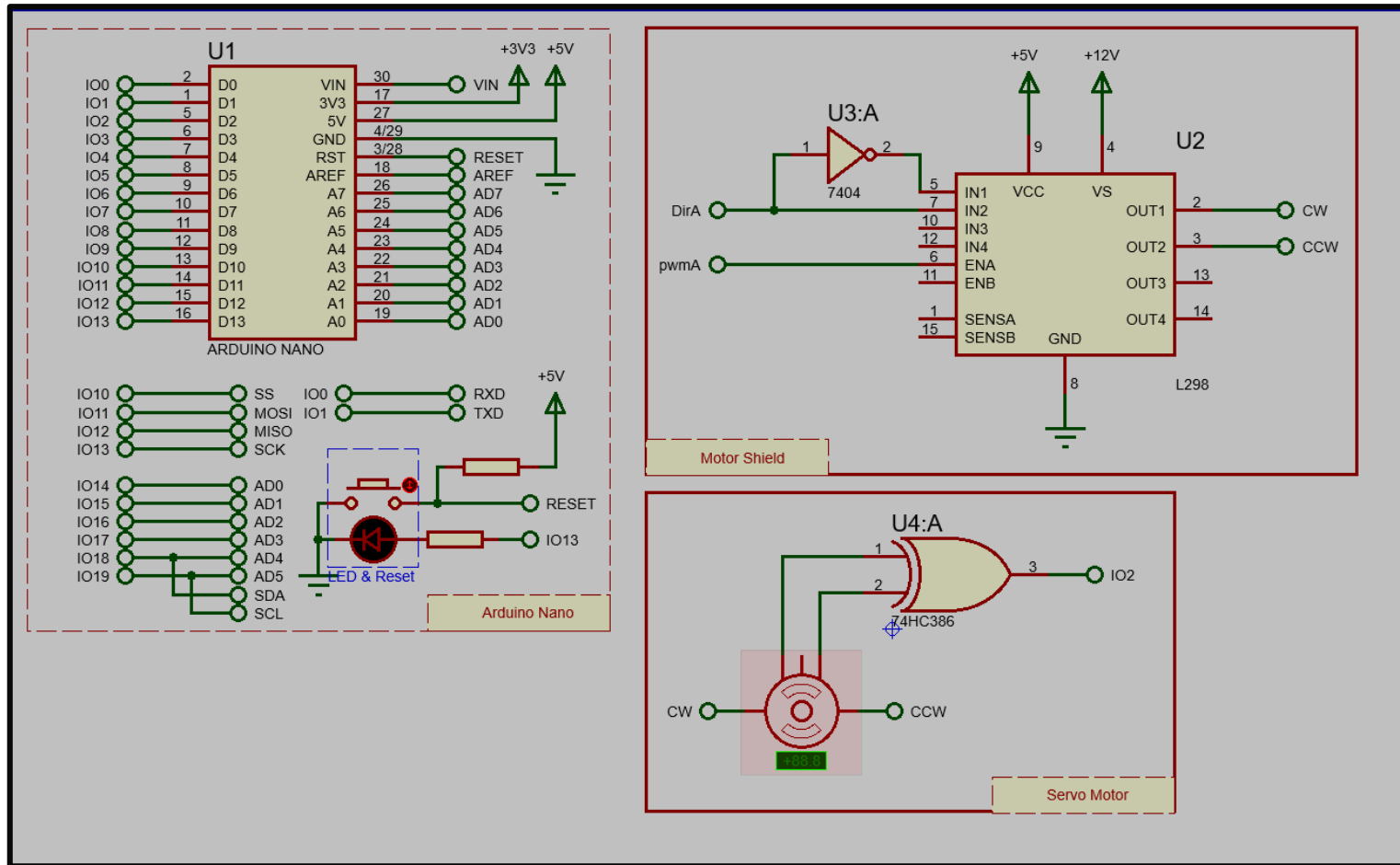
Using External Interrupt



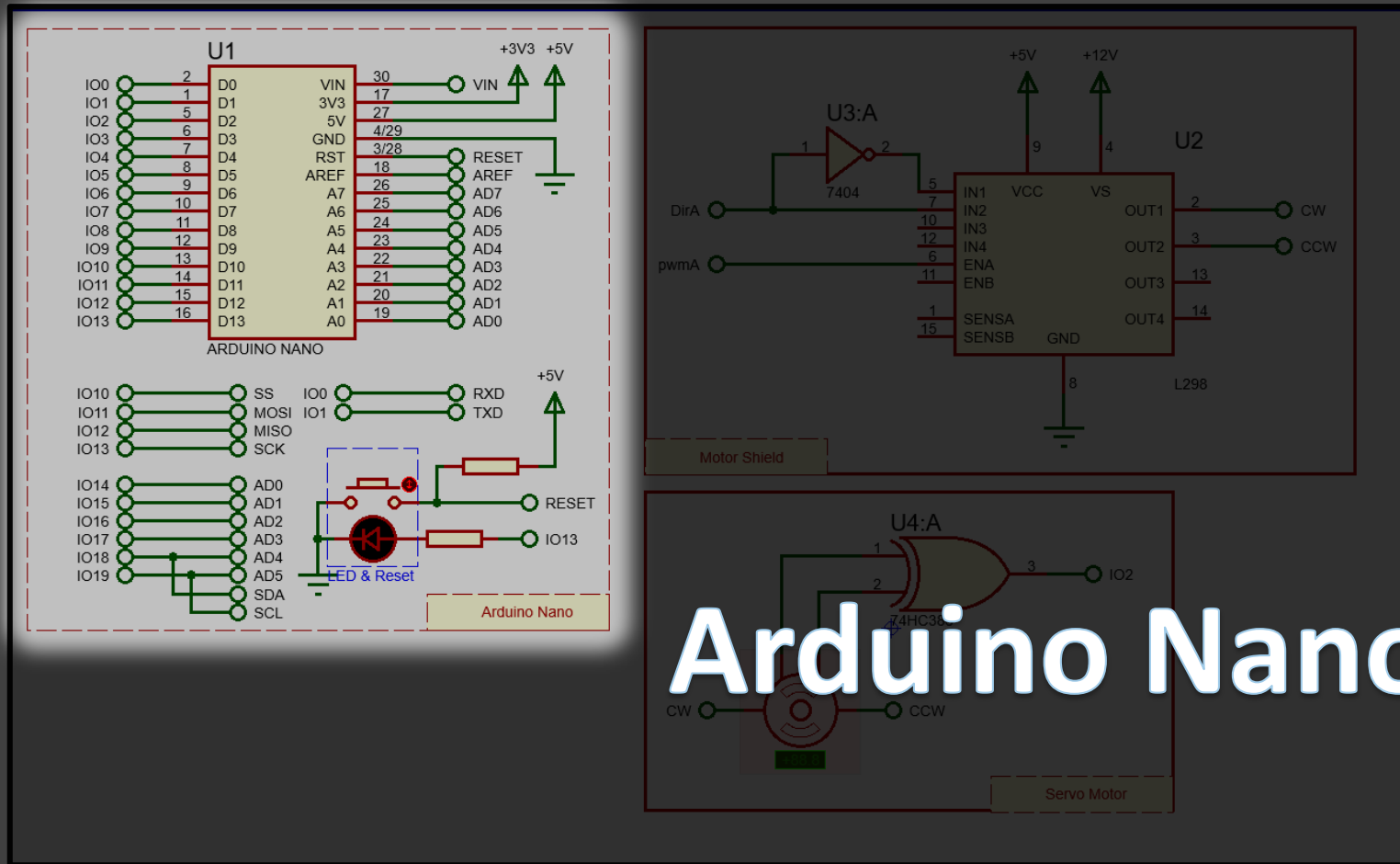
Sharing Variables between interrupts



# Hardware Configuration



# Hardware Configuration



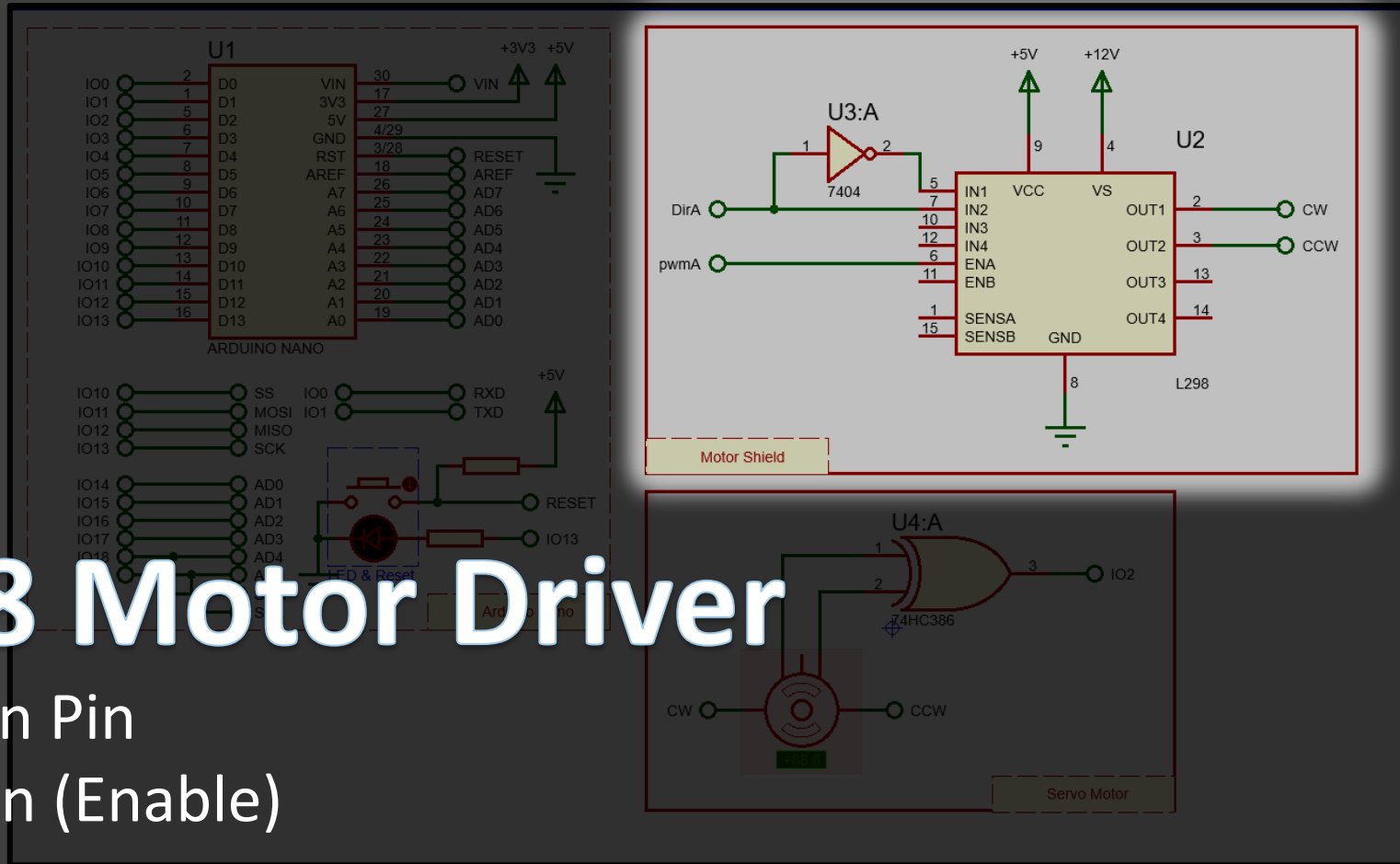
# Arduino Nano

# Hardware Configuration

## L298 Motor Driver

Direction Pin

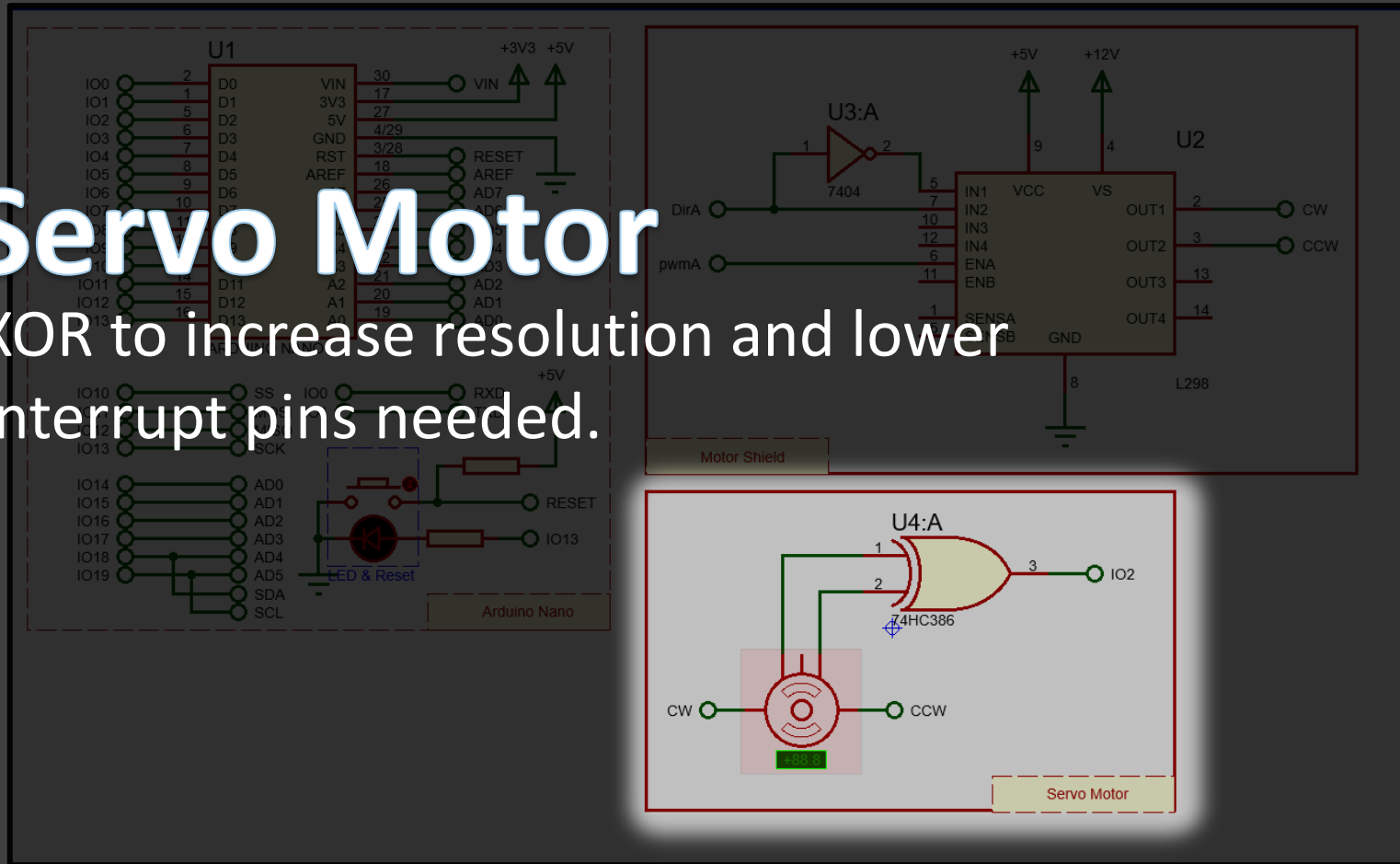
PWM Pin (Enable)



# Hardware Configuration

## Servo Motor

XOR to increase resolution and lower interrupt pins needed.





## Libraries used in code



TimerOne Library

TimerOne by Jesse Tane, Jérôme Despatis, Michael Polli, Dan Clemens, Paul Stoffregen Version 1.1.0  
Use hardware Timer1 for finer PWM control and/or running an periodic interrupt function  
[More info](#)



~~Encoder Library~~

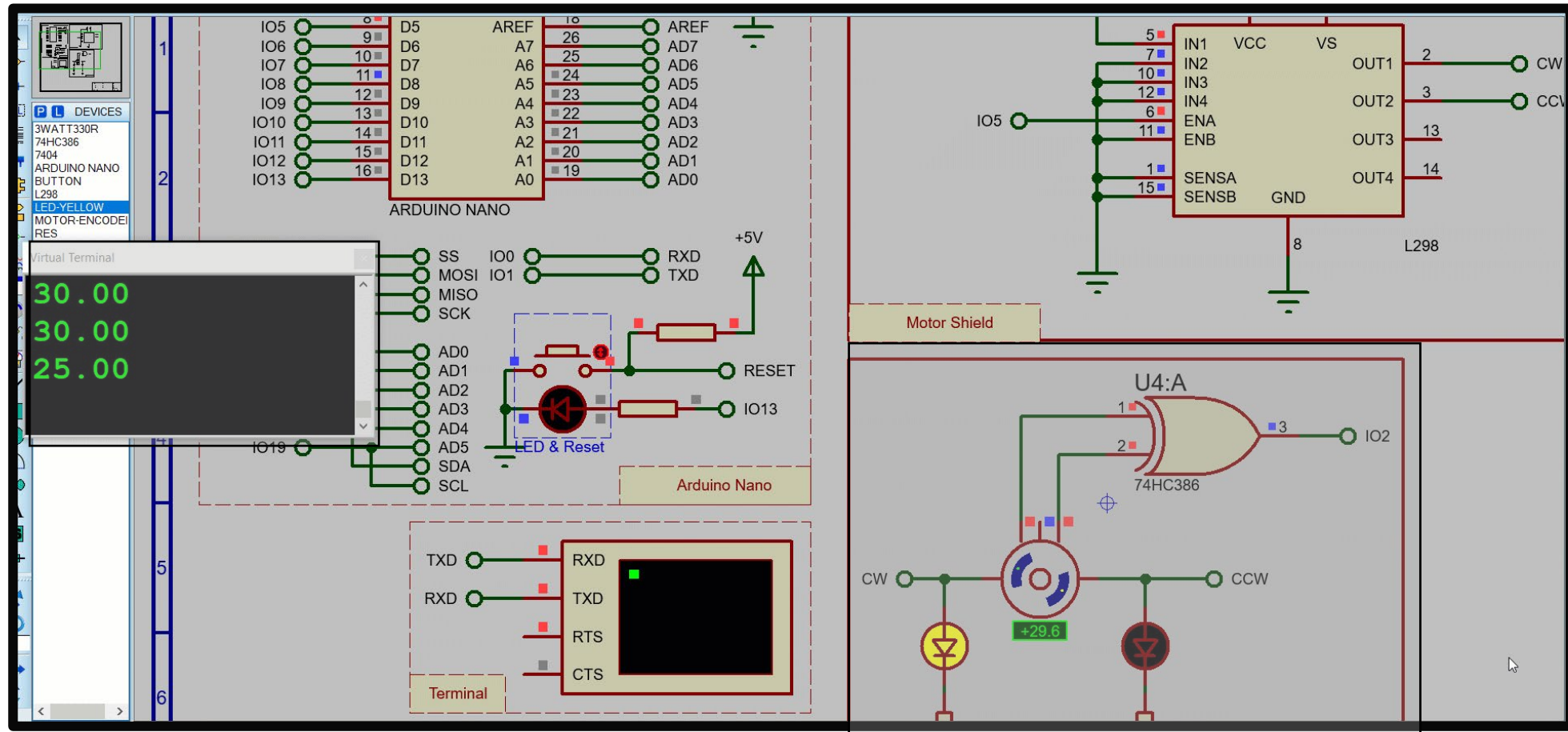
Encoder by Paul Stoffregen Version 1.4.1 **INSTALLED**  
Counts quadrature pulses from rotary & linear position encoders. Encoder counts pulses from quadrature pulses commonly available from rotary knobs, motor or shaft sensors and other position sensors.  
[More info](#)

Select version ▾

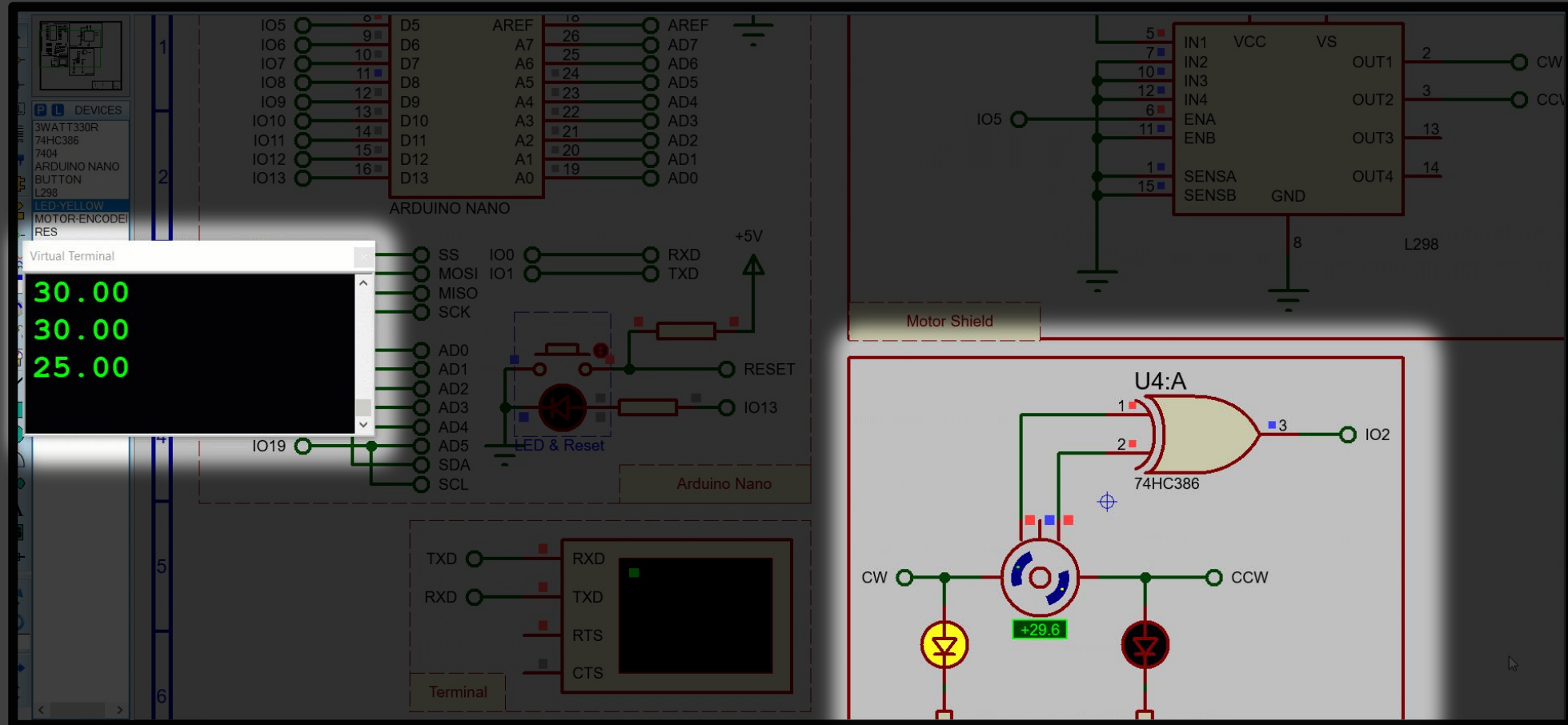
Install

## Lab 6

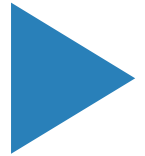
# Final Result



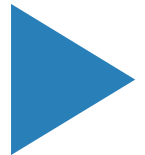
# Final Result



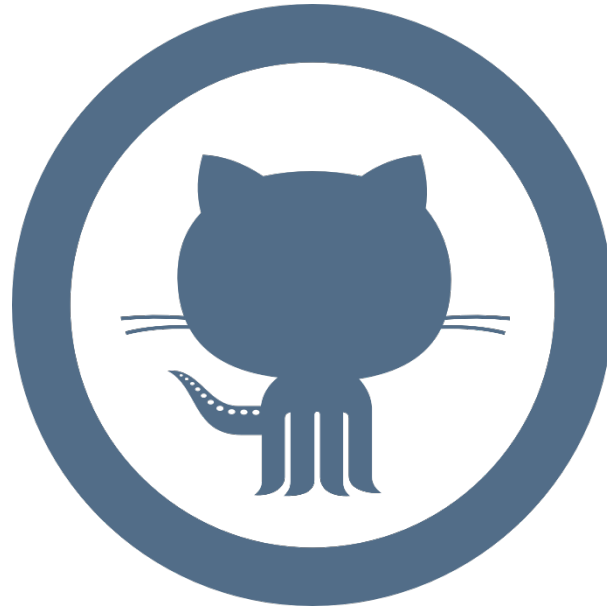
# Classwork



Modify the schematic to communicate with **serialPlot**



Plot and log PWM and Speed



Don't forget to pull the lab update from.

<http://github.com/wbadry/mte405>

END OF Lab 6