CMPE 242 Project
PWM and PID Motor Drive Testing
HL

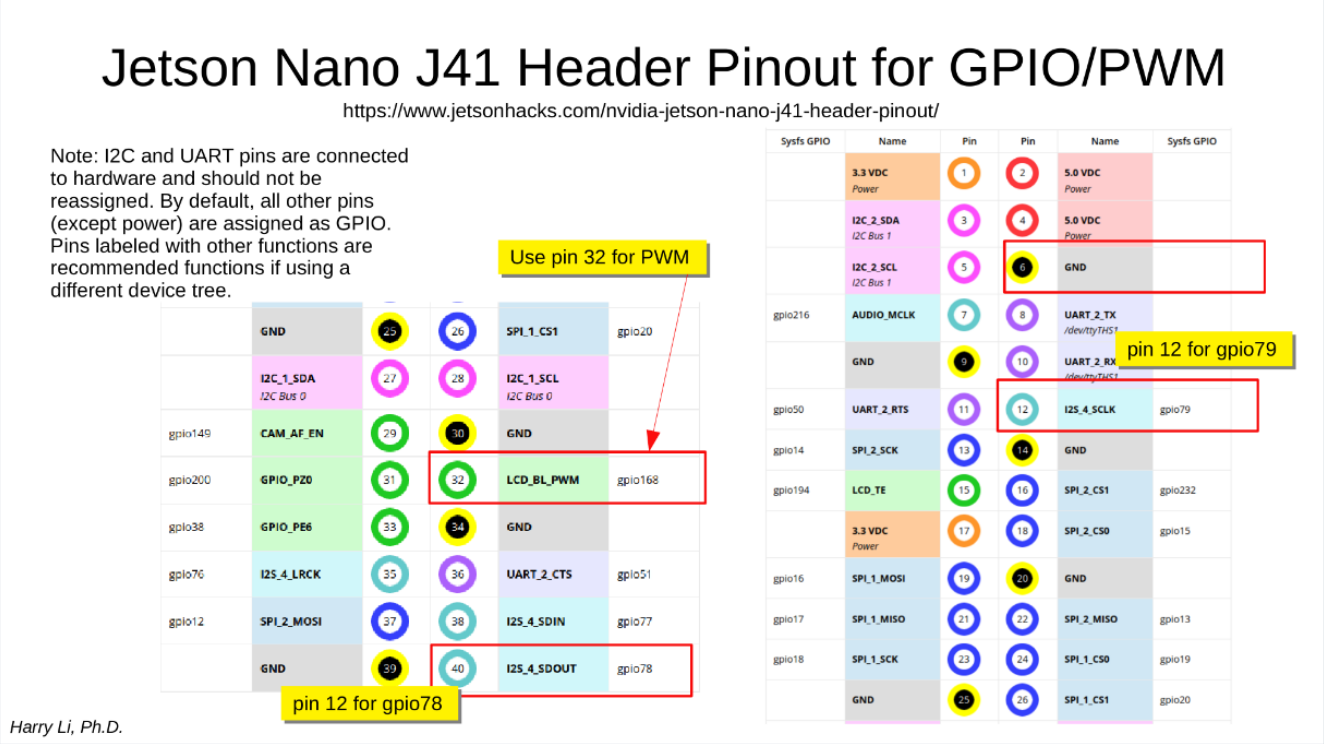
Use your embedded prototype system to build a PID Control platform with PWM and GPIO interace.

The goal is to understand how PWM frequency and duty cycle can be set by inintialization and configureation of TCNTBn, TCMPBn, and configuration registers. You will write (or modify) a PWM device driver program to realize this requirement. In addition, to demonstrate your PWM program, you will build stepper motor drive circuit by using existing motor drive board to change motor speed and direction (clock wise vs. counter clock wise).

1. Requirements

(1. 1) Locate the connector(s) which expose the CPU PWM pin and identify a GPIO (GPP) pins, and connect these pins to the stepper motor drive of your choice.

(1.2) For the NANO platform, use the following pins for your project:
gpio 79, connector pin 12
gpio 78, connector pin 40
pwm, connector pin 32



Ref: https://github.com/hualili/CMPE242-Embedded-Systems-/blob/master/2022S/2022S-106-ioconfig-py-v4-hl-2021-12-19.pdf

(1.3) Mount the motor drive board on the wire wrapping board if using the Easy Drive, otherwise use connector to connect to your motor drive.

(1.4) Write/modify PWM program to allow both frequency and duty cycle change per user application program input. Write an user application program to prompt user input from the ARM development kit, and your program will read user input frequency and duty cycle, and send to the PWM device driver to drive the stepper motor drive, observe the motor speed change and direction change.

2. Submission:
2.1. Source code and binary code;
2.2. Schematics of your design;
2.3. Photo of the implementation;
2.4. Video clips (5 seconds) for program execution and motor movement.
2.5 Create one PDF document to combine 2.2 and 2.3. Then zip all the file into one with the following naming convention:
First_LastName_MotorPWM_CMPE242.zip
Submit to SJSU Canvas.

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