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Prelab and PostLab PID Motor Controller

Prelab:

1. What is the basic difference between an open and closed-loop control system?
    - Open loop systems apply an algorithm directly to generate an output state while closed loop systems use their outputs as an input to calculate a decision based on the error using a process called “feedback”.
2. What does the acronym "PID" stand for?
    - It stands for proportional, integral, and derivative.
3. When does proportional control lose effectiveness?
    - When the plant output nears the set point it starts to lose effectiveness. It also has the limitation of not being able to adjust if the error continues through the initial action.
4. Did you watch the intro videos?

    - Yes.

Post Lab Questions:

1. What gain parameters did you end up using for your PI controller?
    • Describe the response of the system to speed changes.

        // 2:1

        // RPM is 0.5 encoder counts

        // interrupt period = 37.5 ms

        // 37500 timer ticks

    1. What gain parameters did you end up using for your PI controller?

• Describe the response of the system to speed changes. // PSC = 15;

        // ARR = timer tickers / 2 = 18750

The response is that it gradually increases speed until it gets to the target RPM and depending on the Kp and Ki it will be more or less aggressive in its oscillations. To better improve this PID motor controller we would use a derivative to control the oscillations.