Midterm Preparation

Questions?

Information Sources

- In-class exercises
- Zyante book
- Linked web pages
- Lecture notes
- Prior exams
  - Available in the "prior classes" section of my home page

Exam Mechanics

- When: Thursday, March18th, 9-10:15
- Connect to the class Zoom
  - No cameras are required
- Open book; open notes
  - I suggest that you take time to write 1 page of quick-reference notes
  - Scratch paper is allowed
  - All released class materials are fair game
- No calculating devices, including compilers
- Do not use other network resources
- Accommodations: please sign up now

Exam Mechanics

- Multiple choice or numerical answers
- Coverage will be theory to practice
- No generation of code
- But: many questions will be about code
  - Here is code, what does it do?
  - Here is what the code is supposed to do + the code; where is the bug?
  - -> Need to know the API that we have been using

Number Representations

- Conversion between binary and:
  - Decimal
  - Hexadecimal
- Bit-wise operations: &, |, ~, ^

Arithmetic

- Shifting left/right (multiplication/division by 2)

Teensy Digital Input/Output

How to use:

- GPIOx_PDDR

- GPIOx_PDOR

- GPIOx_PDIR

Circuits

- Resistors

- Diodes

- Analog comparators

- Switches

Moving Between Analog and Digital

Digital to Analog:

- Resistive network

Analog to Digital:

- Flash ADC (with analog comparators)
- Successive approximation

Motor Control

- H-bridges
- Pulse-width modulation

PWM and Direction Control
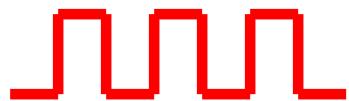
Direction

Two low-current inputs control direction and torque magnitude
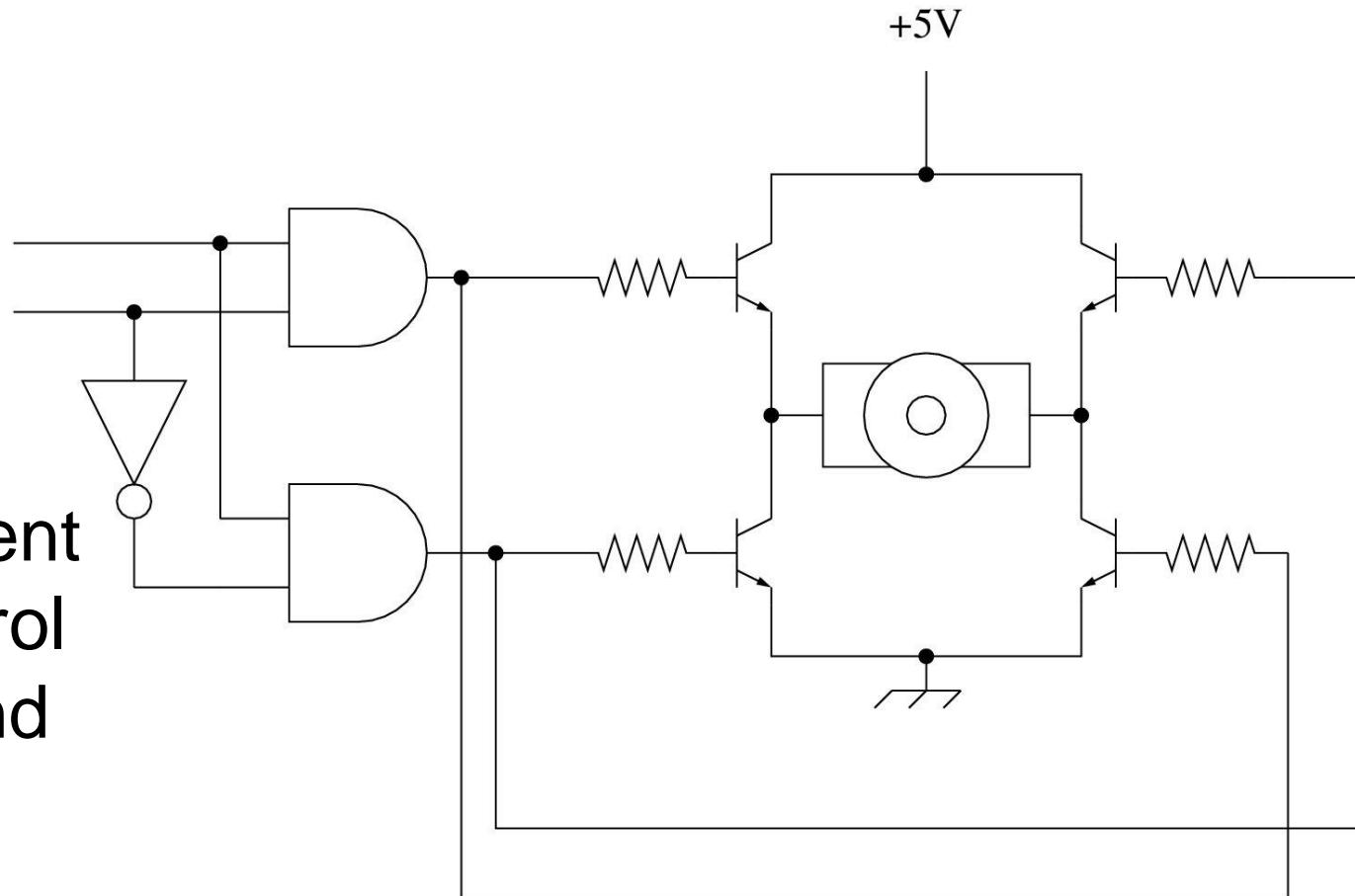
Coding

Possible:

- What does this program do?
- This program is supposed to do X – where are the bugs?

Not on the exam:

- Given a problem, write code to solve it

Finite State Machines

The basics will appear. Given a finite state machine, what happens when a sequence of inputs is received?

- What is the state after the sequence of inputs?

- What is output by the FSM?

Not on this exam…

- FSMs in code
- Negative numbers
- Serial communication