ENGR 3430: Miniproject 3
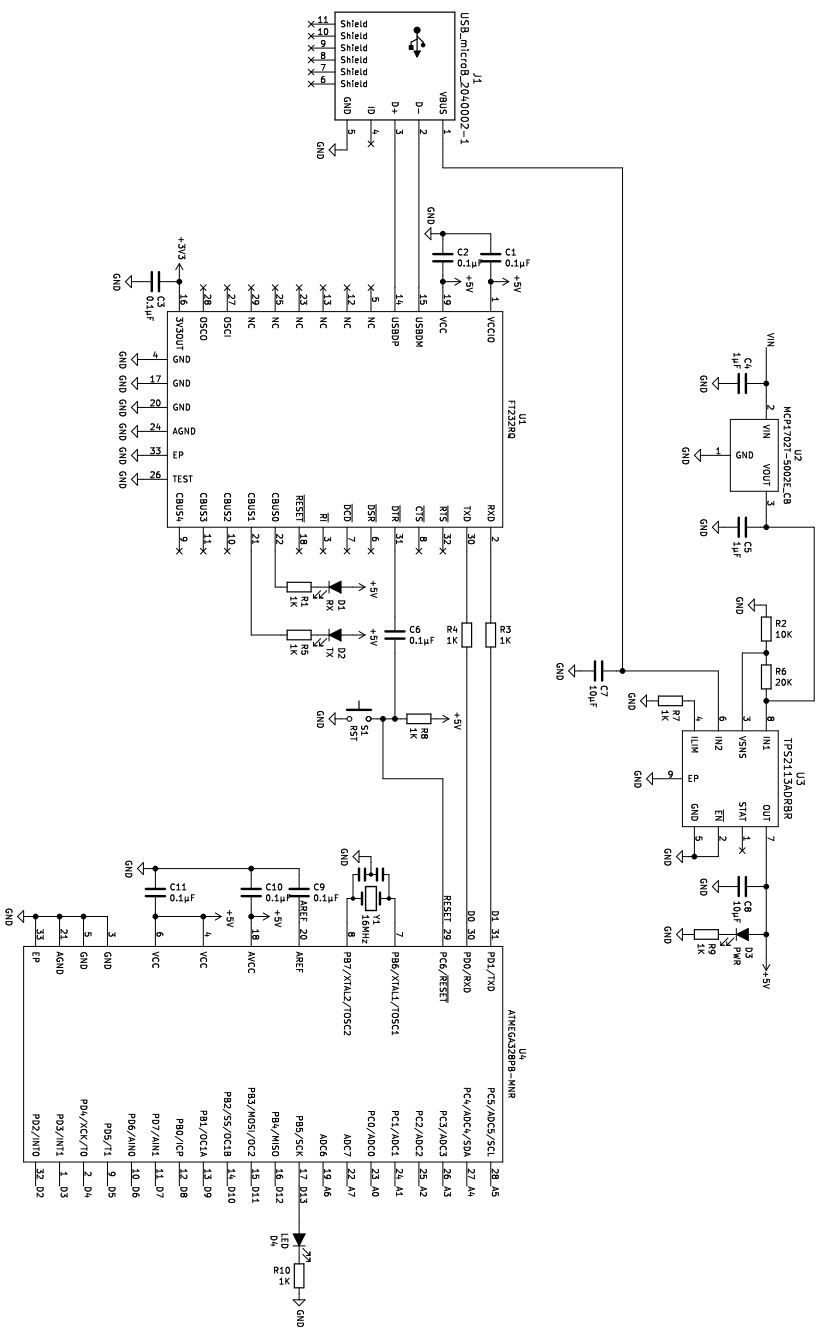
In this miniproject, you will gain more experience doing surface-mouont printed circuit board (PCB) layout and assembly with a more complex circuit. You will be designing your own Arduino Nano clone based on one of two KiCad projects that you can download from the course website. The two versions differ only in the packages used for the two main integrated circuits on the board: the ATmega328P microcontroller and the FT232R USB-to-UART chip. Version A of the schematic makes use of the smaller leadless QFN package options for both of these chips, whereas version B uses the (slightly) larger package options with leads (i.e., a 32-pin TQFP for the ATmega328P and a 28-pin SSOP for the FT232R). We will submit your boards for fabrication through PCBWay. When they come back, you will assemble your board, program the microcontroller with the Arduino bootloader, and demonstrate the standard blink sketch running on your board.
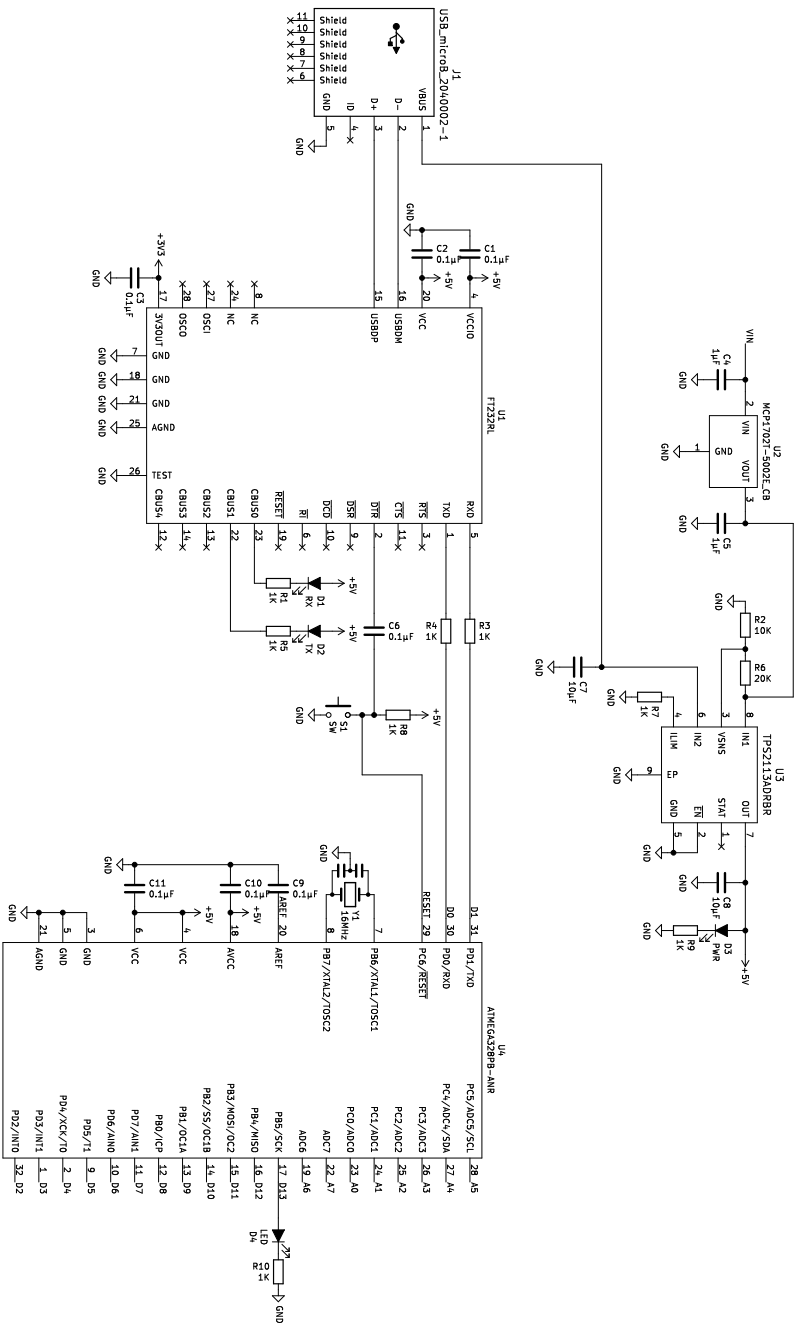
Requirements. Your design must meet the following requirements:

1. It must be a two-layer board, no larger than $3.94 \, \text{in} \times 3.94 \, \text{in}$ (i.e., $100 \, \text{mm} \times 100 \, \text{mm}$) with all components on the top side.

2. The minimum allowable trace width and spacing is 6 mils.

3. The minimum allowable via size is 24 mils with a 12-mil drill hole.

Deliverables. Your final PCB layout is due by noon on Thursday, March 7. You will need to submit copies of all of your KiCad files. Assuming there are no problems with your design, we will generate the Gerber files and submit them to PCBWay for fabrication. The boards should be back from fab sometime late the following week. Once they return, you will assemble your board, program the microcontroller with the Arduino bootloader, and demonstrate the standard blink sketch running on your board by no later than the start of class on Monday, April 1.

Olin College of Engineering
Sheet: /
File: mp3a.sch
Title: Miniproject 3 Version A
Size: USLedger | Date:
KiCad E.D.A. kicad (5.0.0-3-g5eb6b6)
Rev:
Id: 1/1

Olin College of Engineering

Sheet: /
File: mp3b.sch
Title: Miniproject 3 Version B
Size: USLedger | Date:
KiCad E.D.A. Kicad (5.0.0-3-g5ebb6b6)
Rev:
Id: 1/1

J1
USB_microB_2040002-1

U1
FT232RL

U2
MCP1702T-5002E_CB

U3
TPS2113ADRBR

U4
ATMEGA328PB-ANR

J2
Arduino_ICSP

J3
Conn_01x15_Male

J4
Conn_01x15_Male