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Intro Project

In short, the system reads from two input sources, a button and a serial monitor. When the button is pressed, the LED fades on or off. The serial monitor reads for the letters a-f and adjusts brightness from 0%-100% (respectively). Most of the functionality of the project is in the Arduino code. I’m going to try to keep the explanation brief because I don’t think I need to explain the smaller details. In short, the IDE reads for button presses and letter entries. The button pin on the Arduino is set to “INPUT\_PULLUP” and the LED pin is set to “OUTPUT.” In the void loop, we define two functions, fadeIn and fadeOut, these functions do exactly what they sound like: fade the LED in and fade it out. We use these functions when the button is pressed and set a delay of 150ms to ensure the LED fully fades before it registers another button press. Then we have the Serial.read() function begin reading for character inputs. We set a switch statement to handle the possible inputs and, from a-f, set the brightness accordingly. That’s all there really is to it.

My main challenges during the design were due to all the new software that I was learning to use. I had never used any of the software that we were required before in my life. This includes KICad, Arduino, Trello, Githut, Git, etc.. KICad in particular made me lose hairs. The UI for that app is so confusing I just couldn’t wrap my head around how to do anything. Even once the PCB was completed, exporting it to JLCPCB was just as hard as making the PCB in the first place. I got through it by looking up lots of youtube videos and a bit of ChatGPT. Thankfully, I don’t think I’ll ever struggle that badly using KICad again.

My project is now fully completed and I think the skills I gained were really useful. I can really see myself doing future projects in the same step order as how I completed my intro project. The only difference will be that it’ll be a lot easier using KICad the second time so I (hopefully) won’t lose as many hairs.

Below is my BOM and PCB:

"Id";"Designator";"Footprint";"Quantity";"Designation";"Supplier and ref";

1;"330\1";"R\_Axial\_DIN0204\_L3.6mm\_D1.6mm\_P1.90mm\_Vertical";1;"R";;;

2;"C1,C2";"C\_Disc\_D3.0mm\_W1.6mm\_P2.50mm";2;"22p";;;

3;"SW1";"SW\_PUSH\_6mm";1;"SW\_Push";;;

4;"R2";"R\_0603\_1608Metric\_Pad0.98x0.95mm\_HandSolder";1;"10k";;;

5;"H1,H4,H2,H3";"MountingHole\_2.2mm\_M2";4;"MountingHole";;;

6;"Y1";"Crystal\_DS15\_D1.5mm\_L5.0mm\_Horizontal";1;"16MHz";;;

7;"C3";"C\_0402\_1005Metric";1;"100n";;;

8;"U1";"TQFP-32\_7x7mm\_P0.8mm";1;"ATmega328P-A";;;

9;"D1";"LED\_D1.8mm\_W1.8mm\_H2.4mm\_Horizontal\_O1.27mm\_Z1.6mm";1;"LED";;;

10;"J1";"IDC-Header\_2x03\_P2.54mm\_Horizontal";1;"AVR-ISP-6";;;

