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Lab Section – 022
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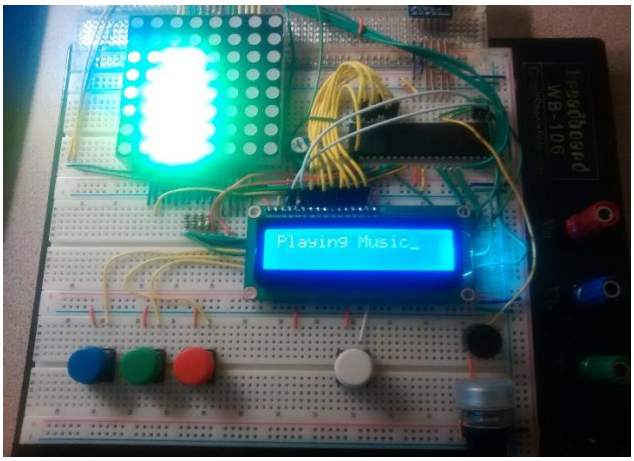
Personal Project Report

High Level Description

For this project I created a music and memorization game. The game plays a musical melody and displays a sequence of colors for the high, low, and mid tone notes of the melody through an attached LED matrix display. The corresponding colors for the musical tones played are; blue for high tones, green for mid-tones, red for low tones. The game then allows the user to replicate the sequence that was played through 3 button inputs. When the user presses a button a corresponding color is displayed in the LED matrix and a corresponding musical tone is played. The game stores the sequence input by the user and compares it to the original played sequence. A score is given at the end that tells the user how many correct inputs were made in comparison to what was played. There are 3 difficulty levels in the game, ranging from very simple musical sequences to very complex ones.



User Guide

The game is very simple to start and play. You press the white button to start the game, it will then ask you select a difficulty. It will play a musical sequence, then allow the user to input a sequence. The user inputs a sequence with the colored blue, green, and red buttons, and confirms it with the white button. The game then displays the results and score.

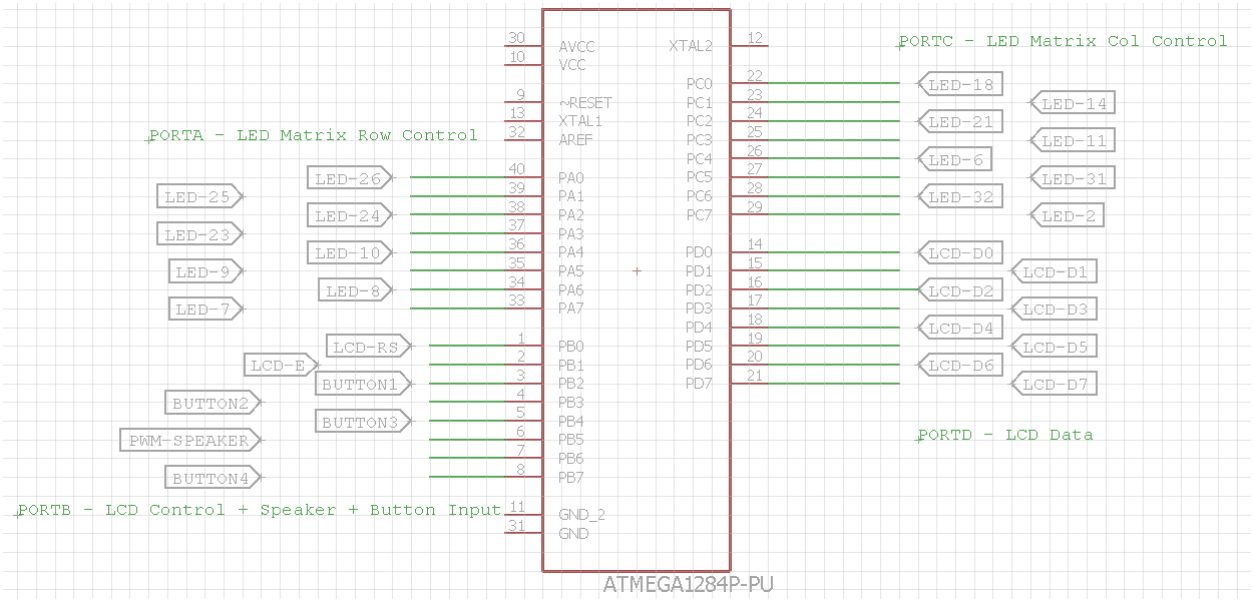
Link to Demo Video

http://youtu.be/cob1zJi9Po4

Link to Source Files

https://github.com/aarri002/EE120B/

Schematics



Technologies and Components

For this project I used the following components:

**included in EE120B Lab Kit*

- 16x2 LCD display*
- ATMEGA1284-PU Microcontroller*
- Olimex AVR ISP mkII programmer*
- Piezo Speaker - PC Mount 12mm 2.048kHz https://www.sparkfun.com/products/7950
- Sparkfun LED Matrix https://www.sparkfun.com/products/683
- 4x Sparkfun Tactile Buttons https://www.sparkfun.com/products/10302
- 10k Potentiometer* (for speaker volume)
- 8x 100Ω Resistors

Conclusion

I managed to implement about 90% of what I originally intended to do with the project. There existed some problems with controlling the LED matrix that did not allow me to make the colors move in the LED matrix the way I wanted them to. But overall I was able to complete the core of the game.

Testing

The game was heavily tested and attempts to break it were made by classmates. Overall there were no major or breaking bugs. The LED matrix I purchased did not have a fast response time from switching off and on per LED, so there was a problem with implementing fast moving shapes.