

Keyboard Hero

EE/CS 120B Custom Project Final Report

Spring 2017

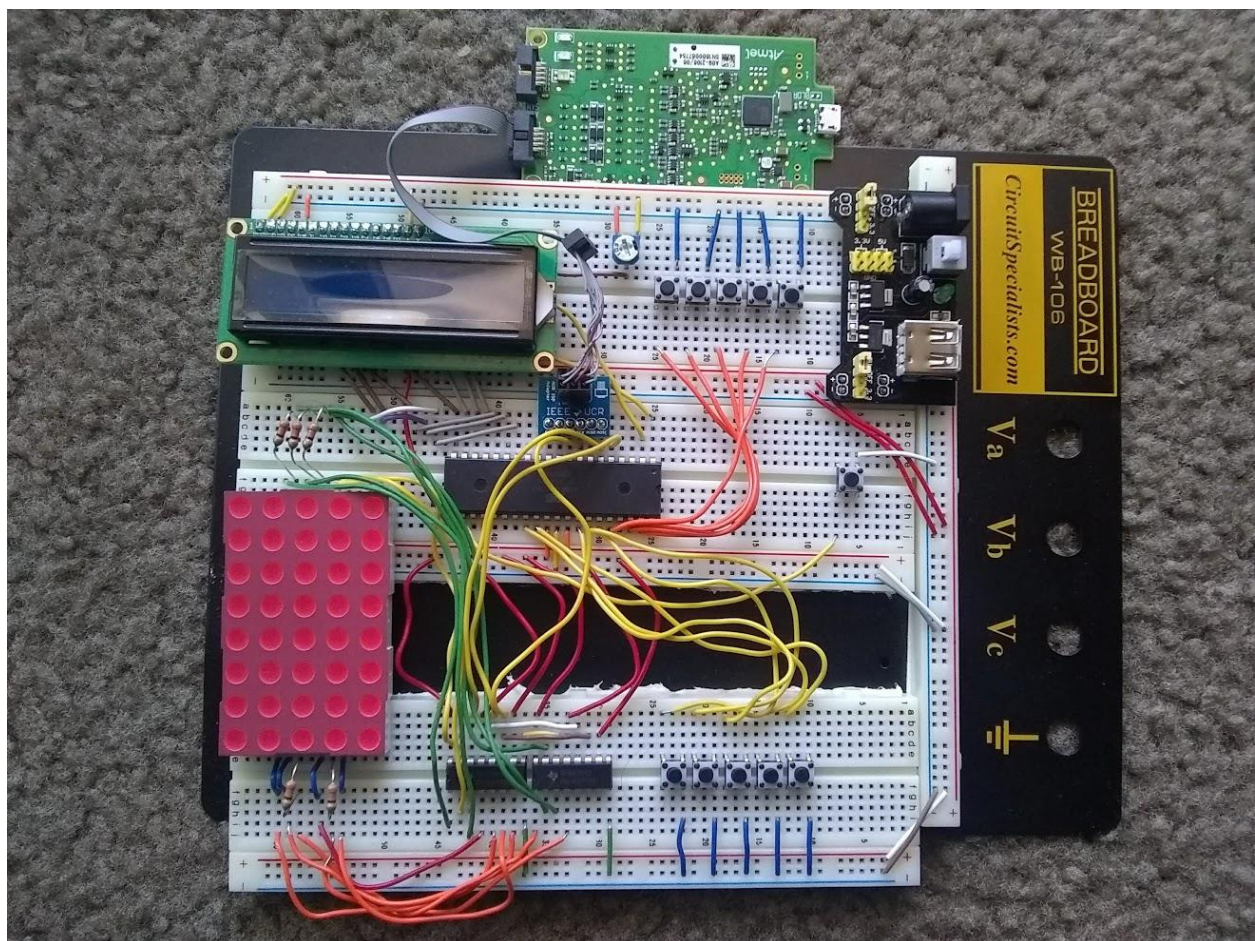
Huzaifah Simjee

Table of Contents

Introduction	3
Hardware	3
Parts List	3
Pinout	3
Software	4
Complexities	4
Completed Complexities:	4
Youtube Link	5
Known Bugs and Shortcomings	5
Future work	5

Introduction

The game of Keyboard Hero tests a users ability to play a keyboard. The player controls a “keyboard” in the form of five buttons. The idea is for the player to hit a button when the light corresponding to that button reaches the last row in the LED Matrix. The LED Matrix will shift a light from the top down to allow the player to know when they will need to press the button. In two player mode, another player can determine the notes (buttons that need to be pressed). The aim is for player one to get a high score and, in two player mode, the aim for player two is to make player one miss as many notes as possible.



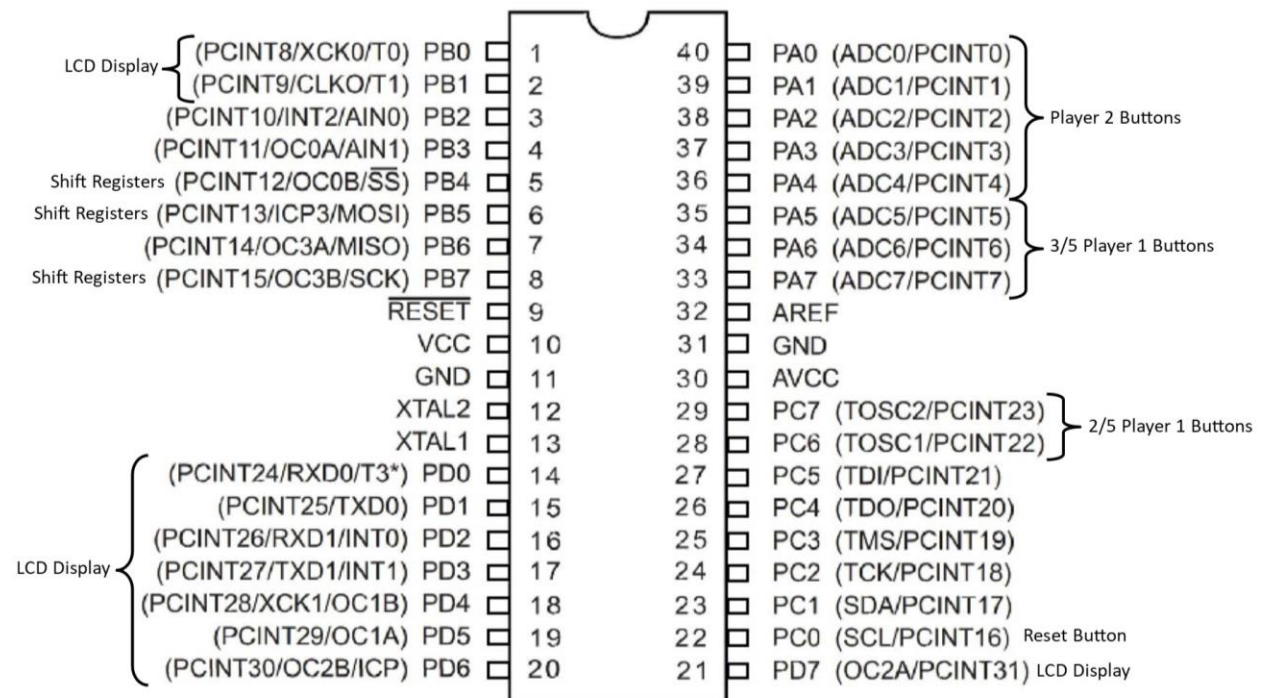
Hardware

Parts List

The hardware that was used in this design is listed below. The equipment that was not taught in this course has been bolded.

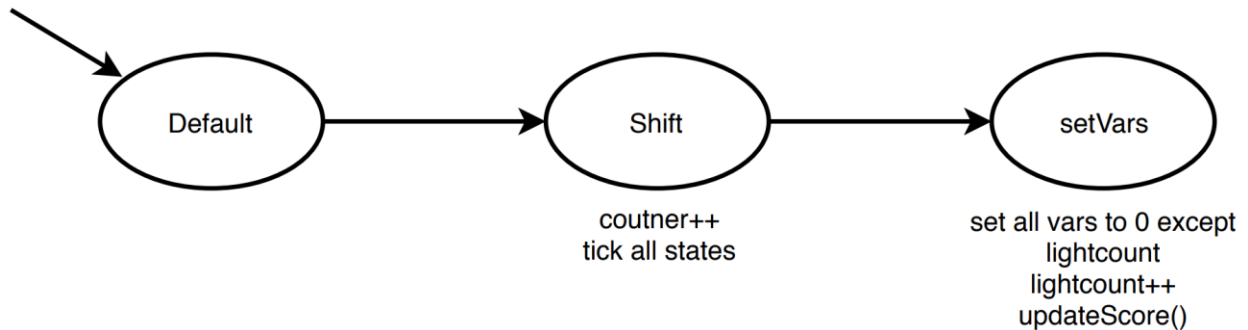
- ATmega1284 microcontroller
- **5x8 LED Matrix**
- Buttons
- LCD Screen
- **Shift Registers**

Pinout

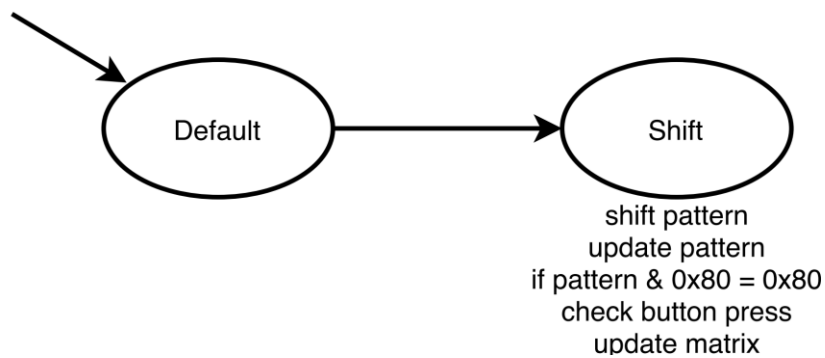


Software

Period 100ms



Period 100ms



The above state machine has five implementations in my code using different variables to shift the pattern.

Complexities

Completed Complexities:

- 5x8 LED Matrix
- Using EEPROM to save the high score (minimum time)
- 2nd Player Mode
- Using shift registers

Youtube Link

<https://youtu.be/ccyQvImhbT4>

Known Bugs and Shortcomings

- Some of the LEDs light up brighter than others at random times
- In two player mode, if two buttons are pressed at separate times, but within the same cycle, the second will not queue up to be outputted in the cycle after the next cycle. Both will be outputted at the same time in the same cycle
- In two player mode, if a button is pressed multiple times in the same cycle, it will shift that note multiple times, so the note will not start at the top of the matrix.

Future work

First of all, I would fix the second player bugs. They will take some time, but it will be worth it before moving on to bigger changes. Once I am done with that, I would move on to add speakers and make the game work with sound. After that, I will add a way to change the run time in two player mode, so it can be determined by the second player. Finally, I will add many more songs so the first player would be able to choose from a variety of different genres and difficulties.