

CS/EE 120B Custom Laboratory Project Report

Wizard Duel

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Introduction

Two players play as two wizards who battle each other. Both players start out at either end of the screen. Players control their character and initiate attacks using buttons. Both wizards start with the same amount of health points. Being hit by the opposing wizard decreases a players score. The winner is the one with the most health remaining at the end. Once there is a winner, the 4 digit 7 segment display shows which player won and the winning score.

The game was originally meant to be played with joysticks. However, there were not enough pins left to connect joysticks so I made it with buttons as the baseline model.

Complexities

Implemented:

- Nokia 5110 LCD
- 4 digit 7 segment display
- Shift register

User Guide

The game can be seen on the Nokia 5110 LCD screen. The controls for the game are the buttons. There are six buttons in total. The first 3 buttons are for player 1, and the next 3 buttons are for player 2. Pressing the first button allows the player down, the second button press will move the player up, and pressing the third button will initiate an attack. This is same for both sets of buttons.

Hardware Components Used

- Elegoo UNO R3 board
- Breadboard
- The 74HC595 shift register IC
- 4-digit, 7-segment display
- Resistors
- PN2222 transistors
- Nokia 5110 LCD
- buttons

Software Libraries Used

The SPI library was used to implement the Nokia 5110 LCD. In addition, the following resources were also used:

The ASCII conversion table was written with the help of the following example:

[Arduino Code](#)

The LcdWriteString(), LcdWriteCharacter(), LcdWriteData(), LcdXY(), and the LcdWriteCmd() functions were written with the help of the following tutorials:

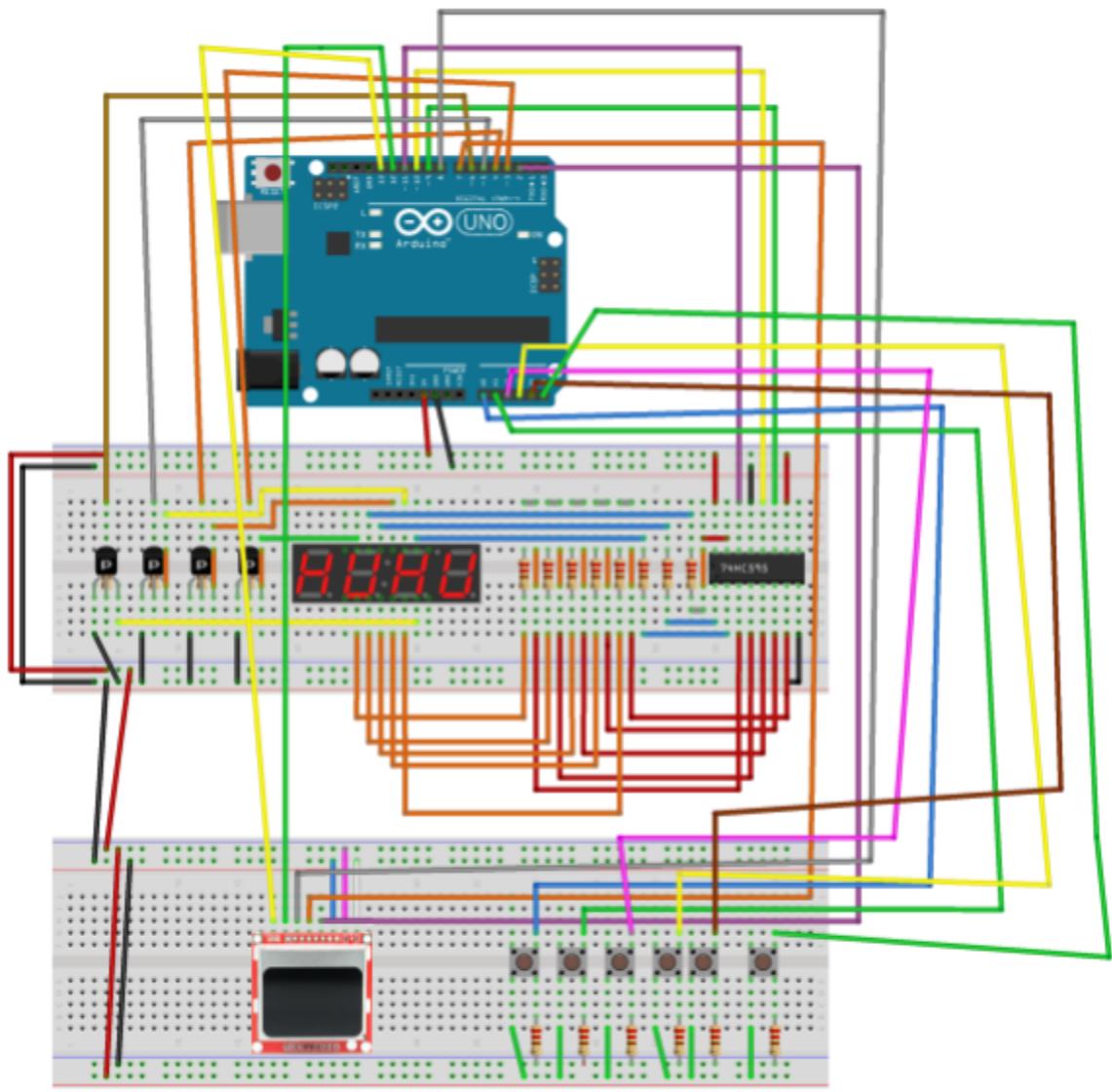
[Arduino Nokia 5110 LCD Tutorial #1 - Connecting and Initial Programming](#)

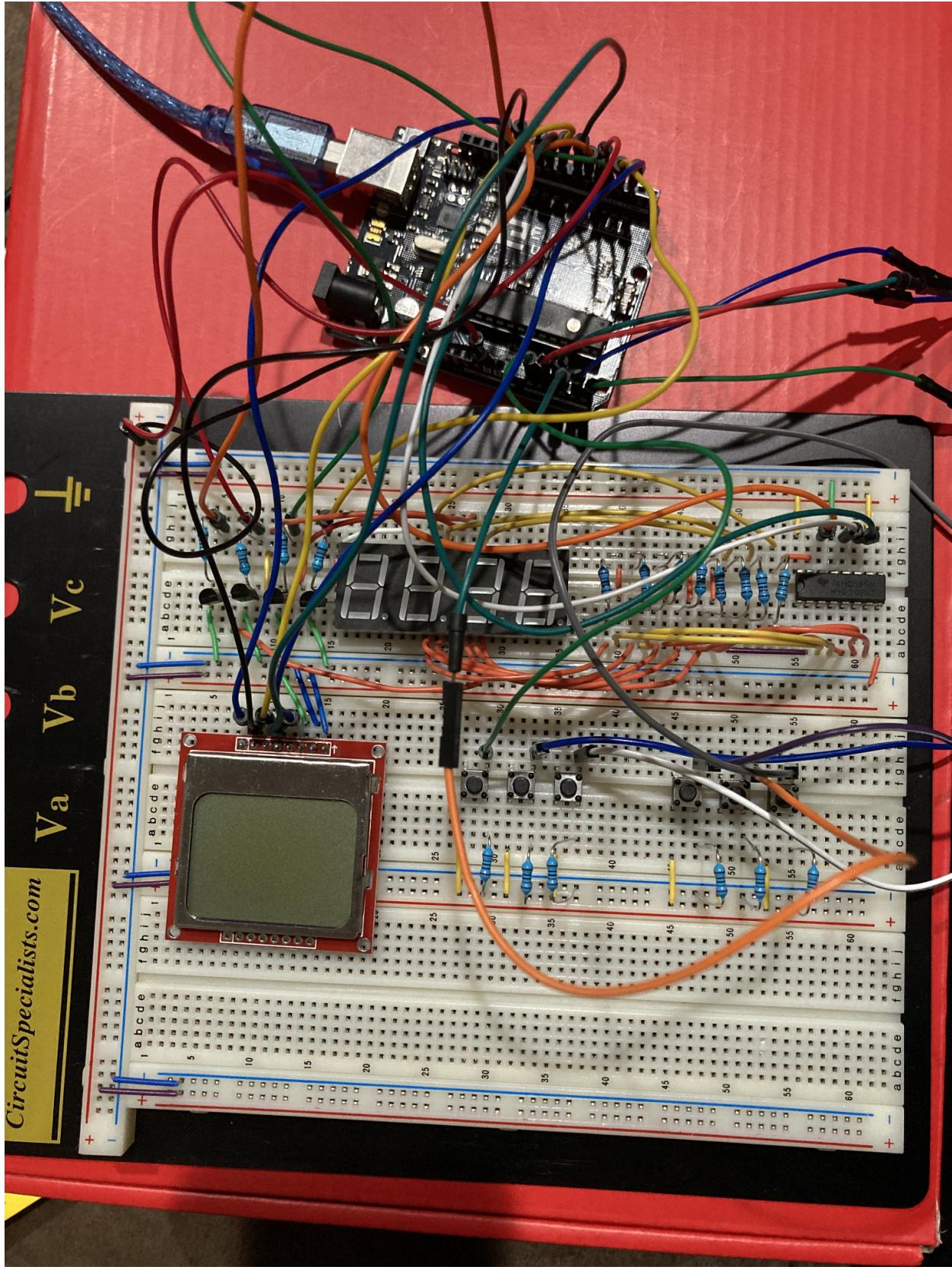
[Arduino Nokia 5110 LCD Tutorial #2 - Getting Text on the Display](#)

The displaySegments() and displayDigits() functions and the byte table was written with the help of the following tutorial:

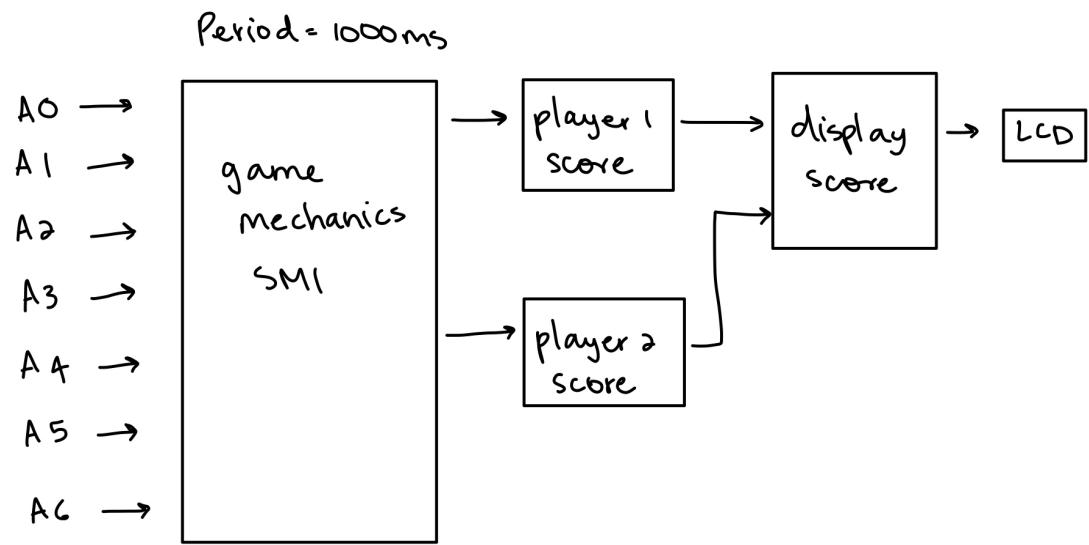
[Lesson 28 - 4 Digit 7 Segment Display](#)

Wiring Diagram





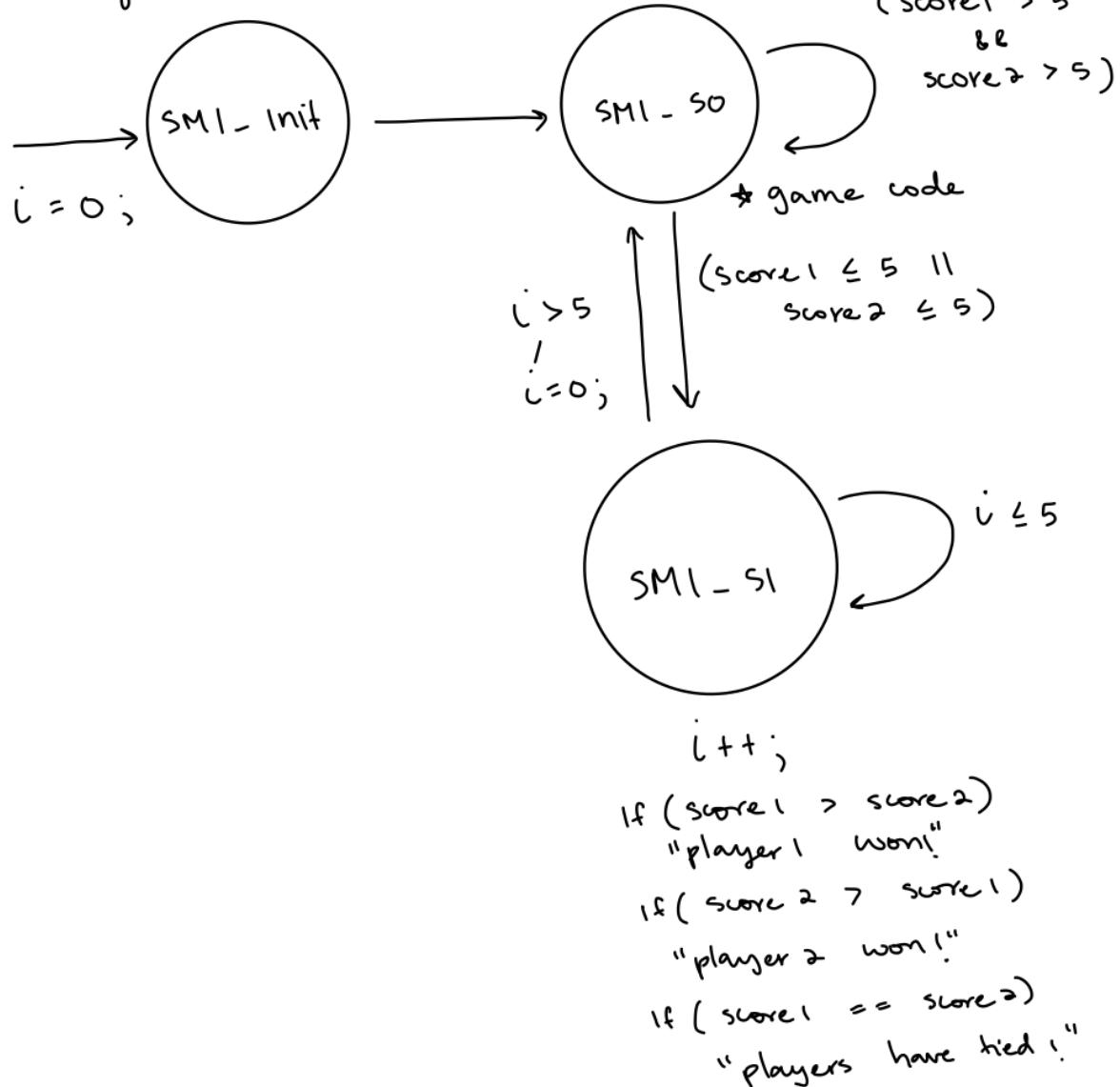
Task Diagram



SynchSM Diagrams

SM_1

1000 ms Period
unsigned char i;



Period = 1000 ms ;

unsigned char j;

