CPE 301 1104 - Lab Report 6

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1 Abstract/Introduction

This lab taught us how to work with membrane keypads and a 16X2 LCD Display. We constructed a keypad, outputted to a display, and worked with custom characters in the LCD. Overall, we controlled the LCD, which displays individual ASCII characters, by using a keypad. Each of the small rectangular areas in our LCD was made up of a 5X8 pixels gto.d

2 Experimental Design

We used an Arduino Atmega 2560 connected to a computer with the Arduino IDE. We also connected the LCD and the matrix keyboard to the Arduino. The LCD was connected to a potentiometer, connected to a 330 ohm resistor. See Figures 1 and 2 for the equipment and breadboard setup. We modified the display.ino code provided from Canvas by filling in the loop function.

The objective of this lab was to control the movement of a special character, a heart (displayed on the LCD), using the keypad. On the LCD four square characters were also displayed (these would not move). If the "4" was pressed, the heart character moved left one time. If the "2" was pressed, this character moved up one time. If the "6" was pressed, the character moved right one time. If the "8" was pressed, the character moved down one time.

If the heart was at the end of the row, pressing "right" again would result in the heart appearing at the far left of the row (and vice versa). If the heart was at the bottom of the column, pressing "down" again would result in the heart appearing at the top of the column (and vice versa).

As an added addition, I had a square disappear if the heart moved to the same square as it ('touches' it), which is what I recall Dr. Anima showing with her demonstration in the lecture (but I'm not sure). Moreover, the Serial monitor would print "You scored!"

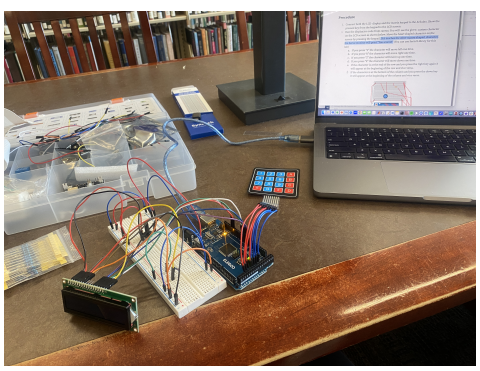

Figure 1: The setup of the Arduino, LCD, breadboard, and keypad.

3 Results

When we pressed a key on the computer, we would see the ASCII code for the string outputted in the serial monitor window in the follow format: "0xYY" followed by a new line character. If "1" was pressed, for example, "0x31" would be outputted. See Figure 1 (below) for more example outputs.

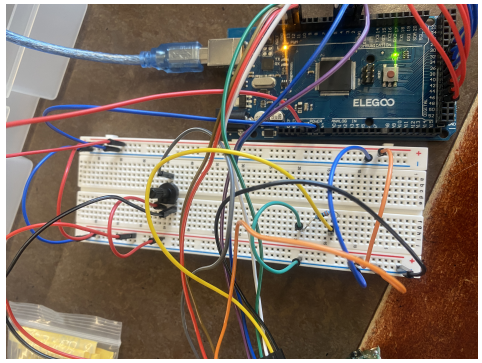

Figure 2: A closer zoom-in of the breadboard setup.

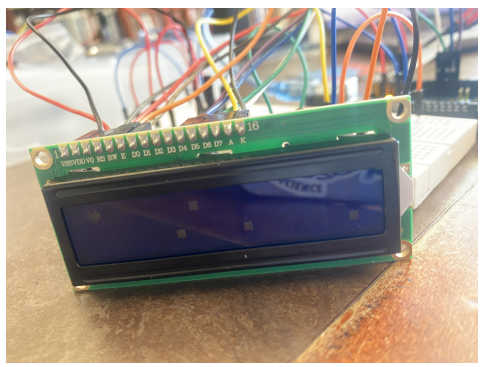

Figure 3: The default state of the LCD before making keypad presses.

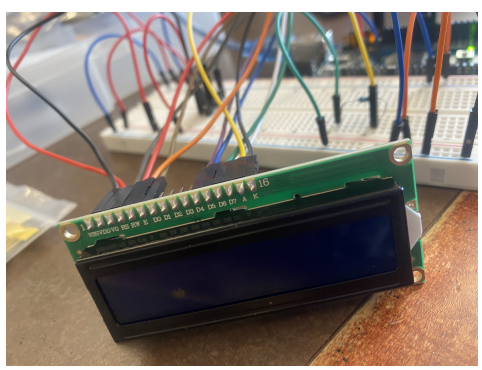

Figure 4: Results following touching all the squares (all squares gone). Here, we can see the heart moved. Results are not shown, but the serial monitor displayed "You scored!" four times.