Specification Sheet: ECE 312 Final

Aaron Fennema: 1437623

Nathan Ton: 1431243

Description

The cost of the prototype was estimated to be: $23.86

* 6 X Omron BF3 Switches - $6.30
* 6 X 330Ω Resistor - $1.20
* ATMega328P - $1
* 5V Backlit LCD (Sparkfun) - $15.36

Our project aims to create a small game program based on cognitive ability. The user will be able to test their memory capabilities as they copy a light sequence by pressing a button corresponding to each LED in the order shown. The game continues to increase in difficulty by increasing the length of the sequence until the player inputs an incorrect sequence or ten rounds have been completed. After the game ends, the number of rounds passed will be displayed to them on the LCD. The difficulty can be altered initially by changing the duration of the light sequence shown.

The device, an ATMEGA328-PU MCU, given for this laboratory is used to create the game, which will display in game information on a LCD screen. Using the Sparkfun LCD screen connected to MCU pins PD0 - PD3 and PC3-PC5, it will produce information to the player. The LEDs, which connect directly to the MCU ports PD0-PD1, PC4-PC5, and PB4-PB5.

The buttons (or switches) are connected to MCU as well. The pins that the switches connect to are PB6-PB7, PD5-PD7, and PB0. These switches will each correspond to one LED during the game, which the user use to replicate the sequence given by the LEDs.

Operating Conditions

The red and green LED runs at 1.2V and 15mA. The MCU runs at 3.3V and 15mA. NEWHAVEN LCD screen only works with 3.3V.

Prototype Functionality

The prototype functionality was a bit off since the pins for the LEDs were not lining up with the button pushes. This caused the compare between button pushed and LED sequence to be wrong. Other than this issue the program worked really well.



