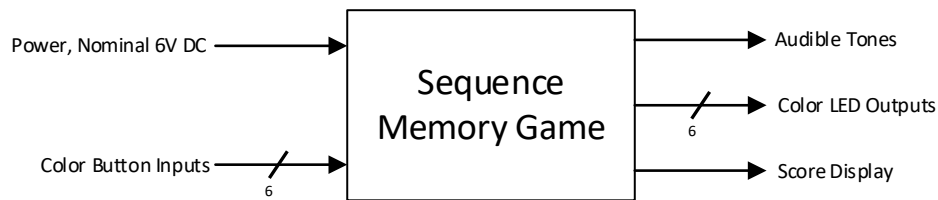
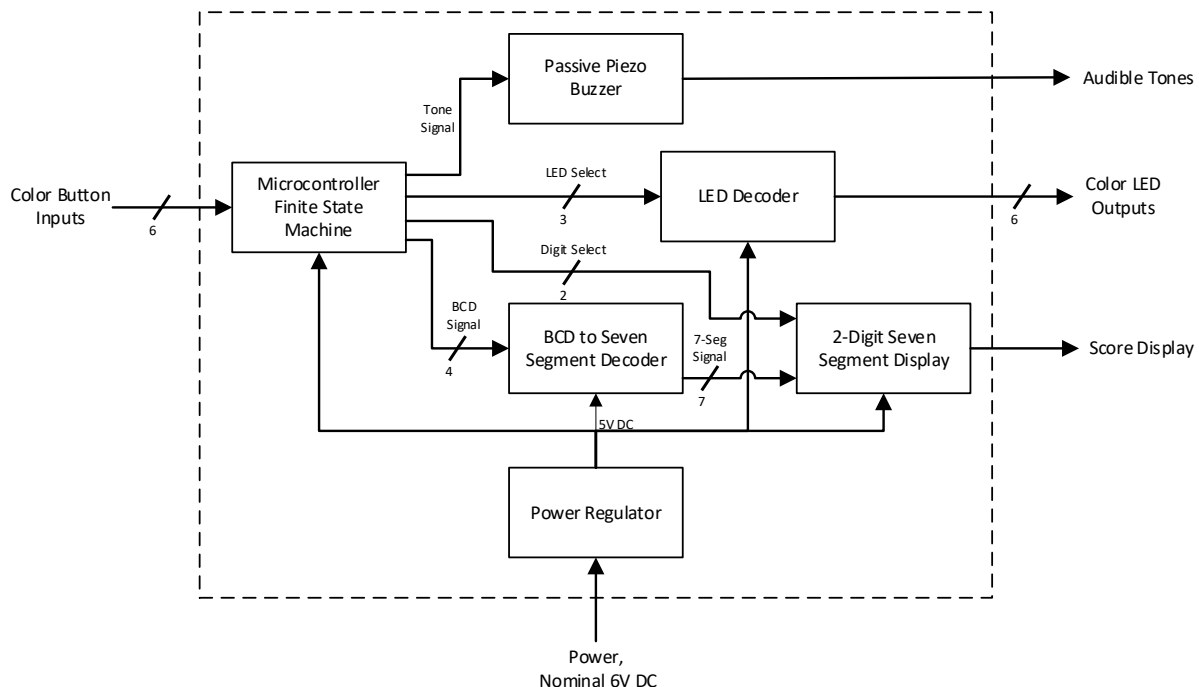


Sequence Memory Game: Level 0

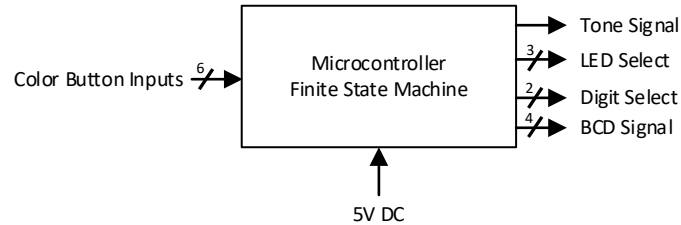


<i>Module</i>	Sequence Memory Game
<i>Inputs</i>	Power: Nominal 6V DC provided by 4 x AA Batteries Color Buttons: 6 Buttons corresponding to 6 different colors (red, yellow, orange, green, blue, purple)
<i>Outputs</i>	Audible Tones: Passive piezo buzzer to generate tones that correlate to colors Seven Segment Display: Reports current score to the user Color LEDs: 6 LEDs to correspond to button colors
<i>Functionality</i>	Game that generates a pseudorandom sequence where each element corresponds to a colored LED and tone. Sequence is output starting at length of one and increases in length by one each round. User attempts to input the correct sequence using buttons of corresponding colors to advance to the next round and set the high score.

Sequence Memory Game: Level 1

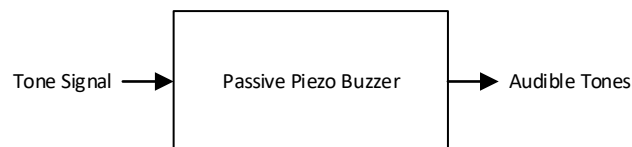


Microcontroller Finite State Machine: Level 1



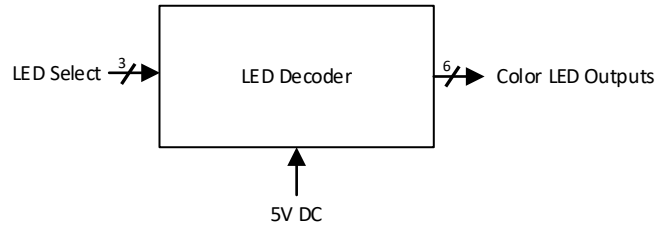
<i>Module</i>	Microcontroller Finite State Machine
<i>Inputs</i>	5V DC: Regulated 5V DC provided from power regulator module Color Buttons: 6 Buttons corresponding to 6 different colors (red, yellow, orange, green, blue, purple)
<i>Outputs</i>	Tone Signal: Output signal to drive passive piezo buzzer with tones LED Select: 3-bit signal to select appropriate color LED Digit Select: 2-bit signal to select digit of seven segment display BCD Signal: 4-bit BCD signal to output value of seven segment display digit
<i>Functionality</i>	Finite State Machine that is hosted on a microcontroller that drives current state of game. The LED and tone signals are used to output the sequence and acknowledge user input. The seven segment signals are used to report to the user the score of the game. States used are Idle, Start, Display Sequence, Input Sequence, Win, and Lose.

Passive Piezo Buzzer: Level 1



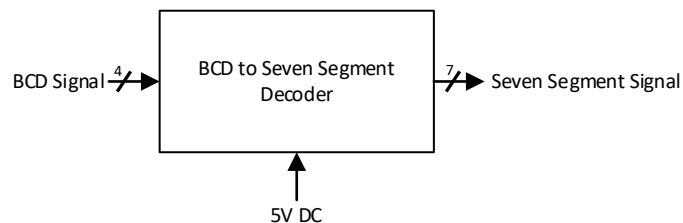
<i>Module</i>	Passive Piezo Buzzer
<i>Inputs</i>	Tone Signal: Input signal from the microcontroller that drives the tone at a specific frequency
<i>Outputs</i>	Audible Tones: Tones that correspond with the 6 different colored buttons
<i>Functionality</i>	Outputs a tone that is driven by the tone signal from the microcontroller. Tones are of a specific frequency to correspond with a specific color in the sequence or the state of the game. For example, when the player inputs an incorrect sequence a low tone is output.

LED Decoder: Level 1



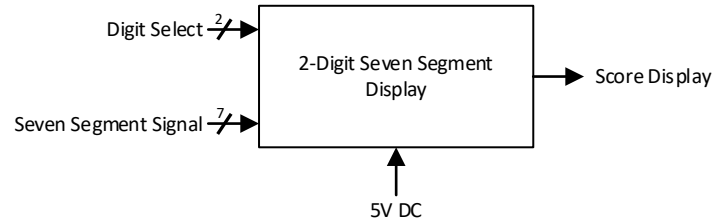
<i>Module</i>	LED Decoder
<i>Inputs</i>	5V DC: Regulated 5V DC provided from power regulator module LED Select: 3-bit signal to select appropriate color LED
<i>Outputs</i>	Color LEDs: 6 LEDs to correspond to button colors
<i>Functionality</i>	Decodes 3-bit LED select signal to drive one of 6 colored LEDs that correspond with the respective color of the sequence displayed or the button input by the user.

BCD to Seven Segment Decoder: Level 1



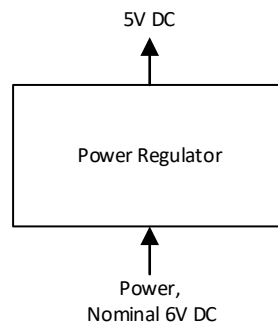
<i>Module</i>	BCD to Seven Segment Decoder
<i>Inputs</i>	5V DC: Regulated 5V DC provided from power regulator module BCD Signal: 4-bit BCD signal to select value of seven segment display digit
<i>Outputs</i>	Seven Segment Signal: 7-bit signal that corresponds to each segment A-F of the display
<i>Functionality</i>	Decodes binary coded decimal (BCD) to the proper signals needed to drive the seven segment display with the correct corresponding digits of 0-9.

2-Digit Seven Segment Display: Level 1



<i>Module</i>	2-Digit Seven Segment Display
<i>Inputs</i>	5V DC: Regulated 5V DC provided from power regulator module Digit Select: 2-bit signal to select digit of seven segment display Seven Segment Signal: 7-bit signal that corresponds to each segment A-F of the display
<i>Outputs</i>	Score Display: Outputs the current score of the game to the user
<i>Functionality</i>	Displays the current round or status of the game to the user by illuminating the segments of the display as determined by the BCD to seven segment module. Time division multiplexing is used to drive only one digit at a time fast enough that to the user both digits appear on at the same time.

Power Regulator: Level 1



<i>Module</i>	Power Regulator
<i>Inputs</i>	Power: Nominal 6V DC provided by 4 x AA Batteries
<i>Outputs</i>	5V DC: Regulated 5V DC to provide power to the other modules
<i>Functionality</i>	Regulates power from batteries to provide consistent 5V power to the modules in the system that require power.