Keypad Controlled Lock:

Team: G5
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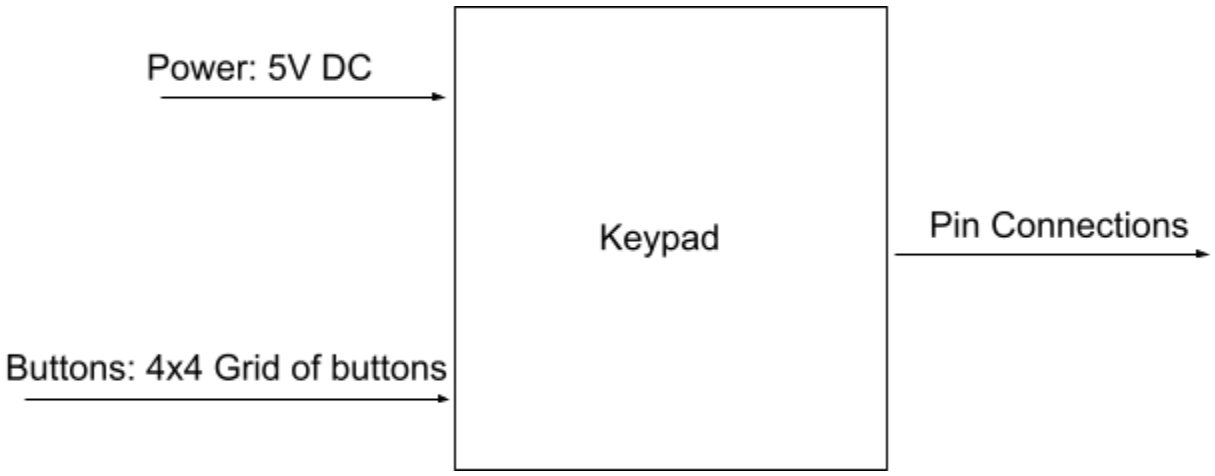
Keypad Controlled Lock: Level 0

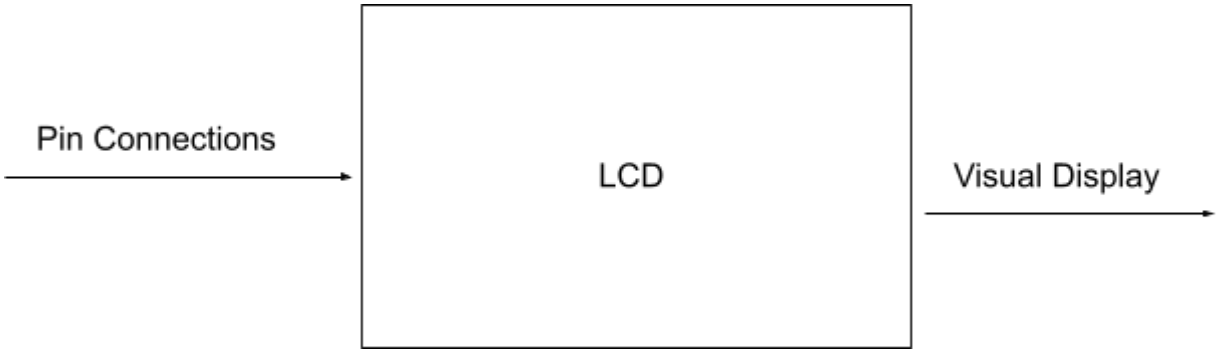
Module	Keypad Controlled Lock
Inputs	Power: 5V DC Push button keypad : 0-9 and A-D inputs
Outputs	LCD screen: 16 characters x 2 Lines Stepper Motor: Open/Close deadbolt lock
Functionality	The system takes a keypad input and processes if a correct value is taken in. If correct, the LCD will output a welcoming or farewell message and the motor will engage to open or close the deadbolt lock based on its current state. If an incorrect value is entered in the keypad, the LCD will display that the entry is incorrect and the stepper motor will remain in its current state.

Keypad: Level 1



Module	Keypad
Input(s)	Power: 5V DC Buttons: 4x4 grid of buttons that contains 0-9, *, #, and A-D
Output(s)	Pin connection: Output signals to microcontroller based on user inputs. This connection is made to the general I/O ports that are present on the microcontroller.
Functionality	The keypad will control all of the user inputs to the device.

LCD: Level 1

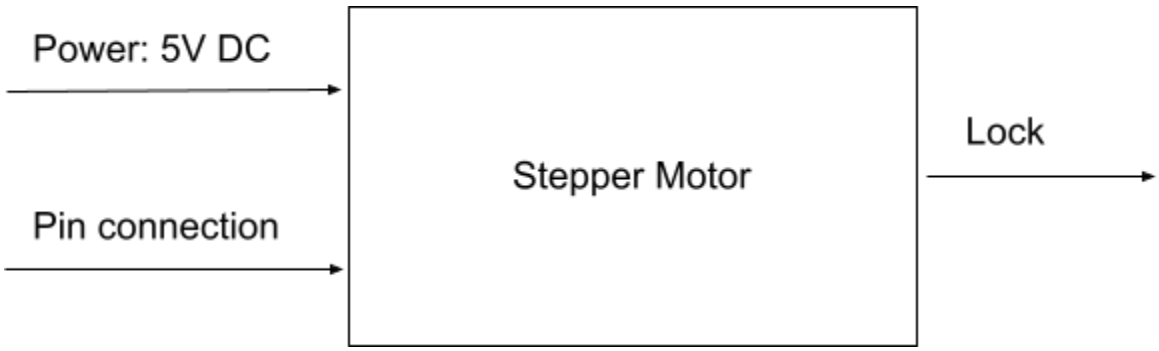


Module	LCD
Input(s)	Power: 5V DC Pin connections: Signal sent from microcontroller determining the characters to display via I2C connection.
Output(s)	Visual display: Characters displayed based on hard coded messages to signal correct or incorrect code entry from keypad
Functionality	The LCD will give a visual output to the user that they have either entered a correct value into the keypad or have incorrectly typed in the password

ATMEGA328P: Level 1

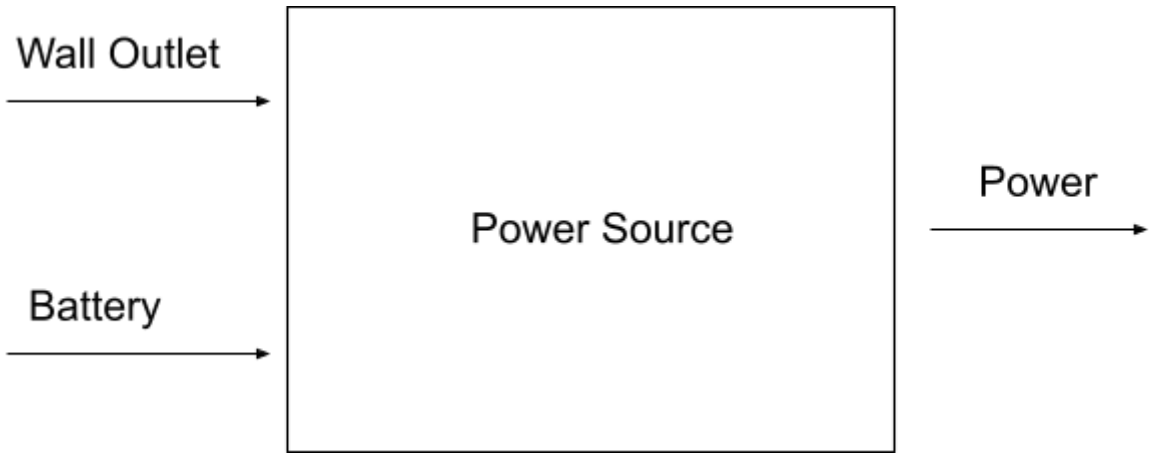
Module	ATMEGA328P
Input(s)	Power: 5V DC Keypad connection: GPI connections to controller signaling user inputs.
Output(s)	Stepper Motor: GPO connections to signal motor to open or close LCD: I2C connection to LCD that sends signals based on keypad inputs.
Functionality	The microcontroller will process the inputs from the keypad and output either to the LCD showing an incorrect input or output to both the stepper motor and LCD screen to signal a correct input.

Stepper Motor: Level 1



Module	Stepper Motor
Input(s)	Power: 5V DC Pin connection: Input signal from microcontroller
Output(s)	Lock: Turn deadbolt from open to close and vice versa.
Functionality	The stepper motor operates to physically turn the deadbolt between an unlocked and locked state.

Power Source: Level 1



Module	Power Source
Input(s)	Wall outlet: Takes AC power and transforms it to DC Battery: Changes chemical energy to electrical energy
Output(s)	Power: Optimally a steady state 5V to the device
Functionality	The power source will supply the voltage necessary to control the keypad, microcontroller, LCD, and stepper motor.