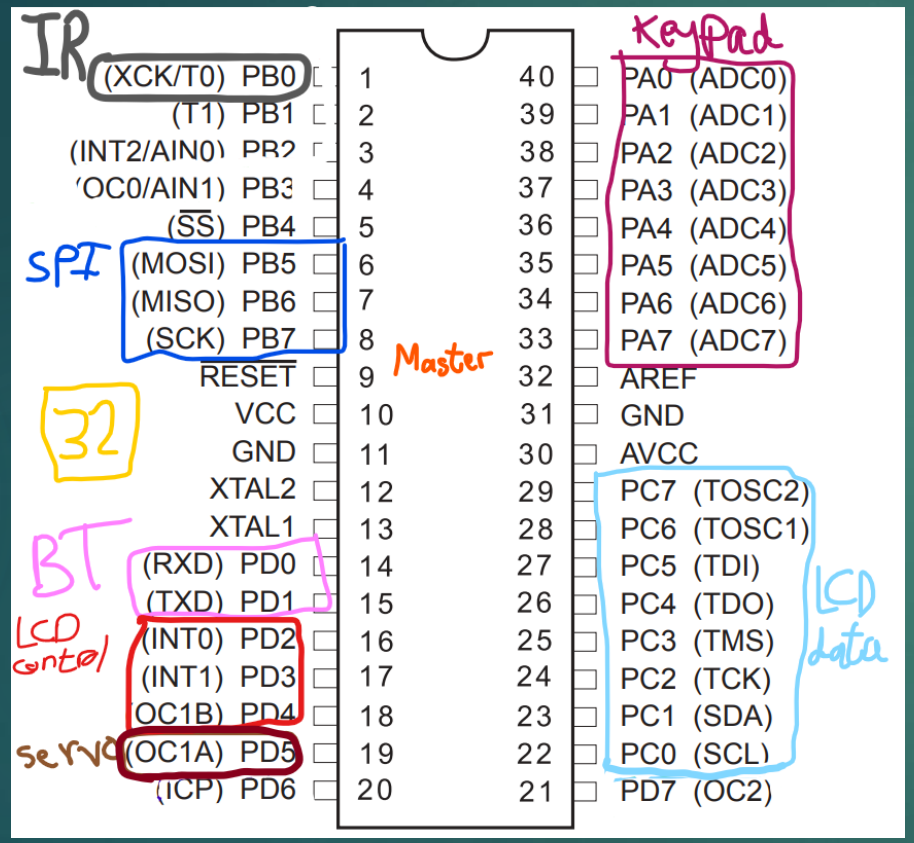
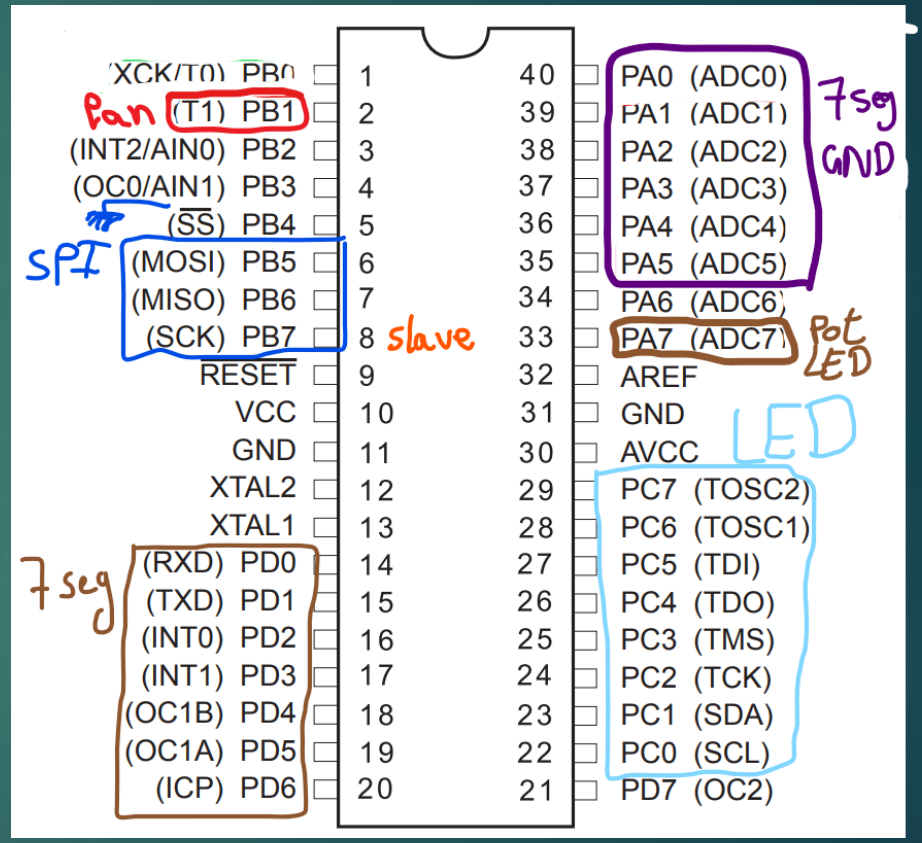
Name : Fares Hossam Amin

Project Title : Bluetooth Controlled System

Circuit Connections



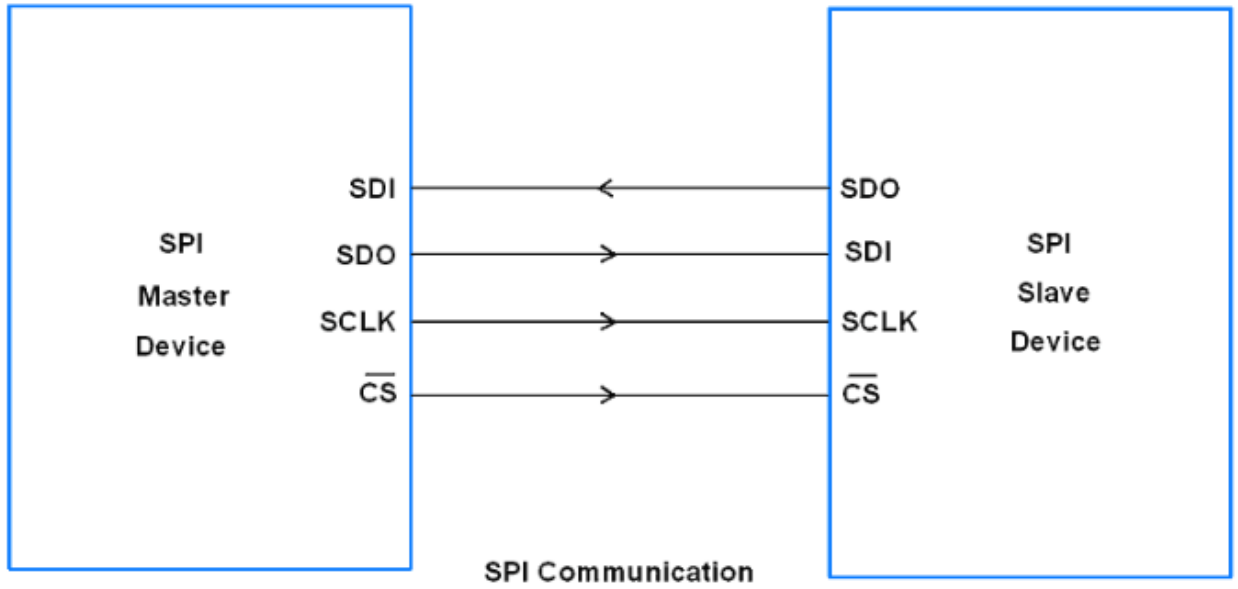


Some of the application and devices used:

- DIO
- LCD
- Keypad
- Timer1 PWM
- Timer0 OVF
- SPI
- UART

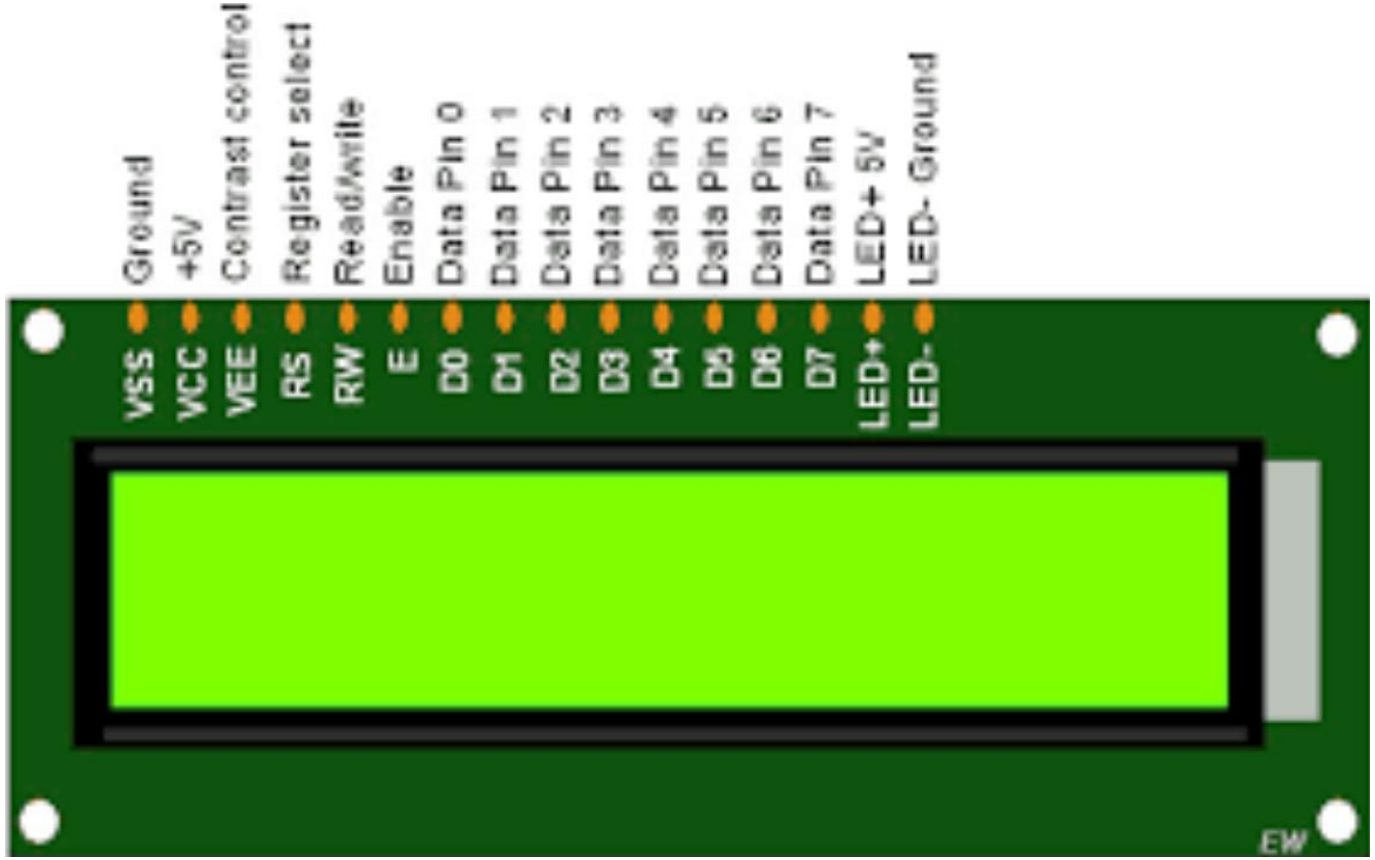
Master – Slave Atmega32 - Atmega16

- We use SPI communication protocol between Master that controls:
- IR Sensor, Door(servo motor), LCD, Keypad, BT module(UART)
- LED + DAC, Fan, 6 7segment displays.



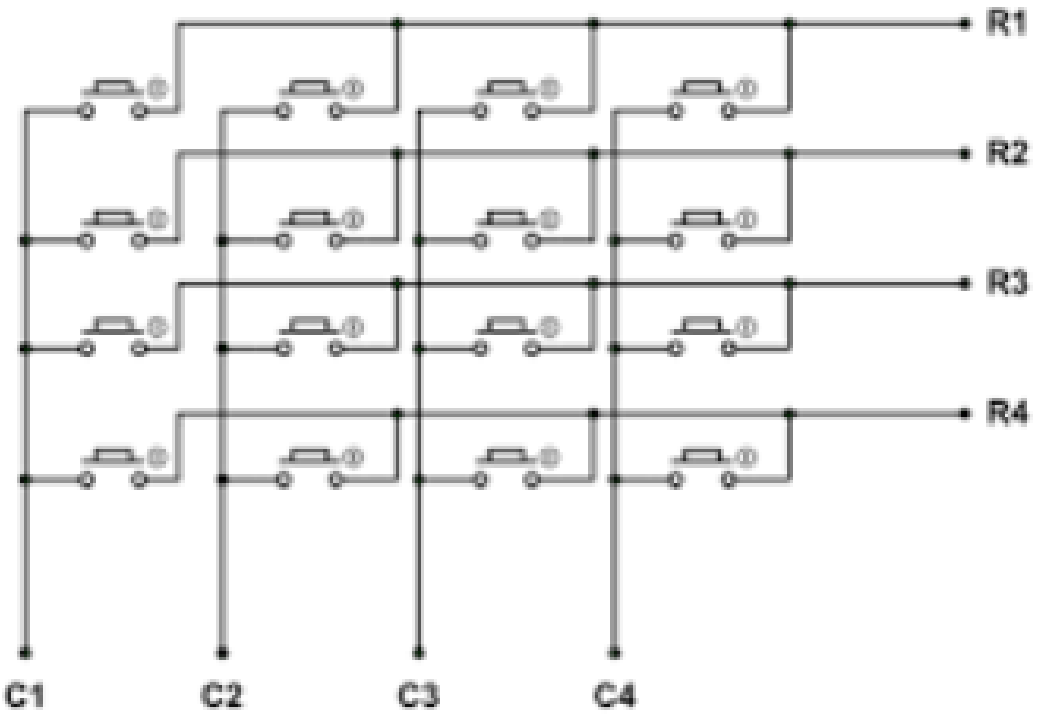
LCD Screen 16x2

- The screen represents the current state of the smart home, like the password UI, the door state and the options UI.



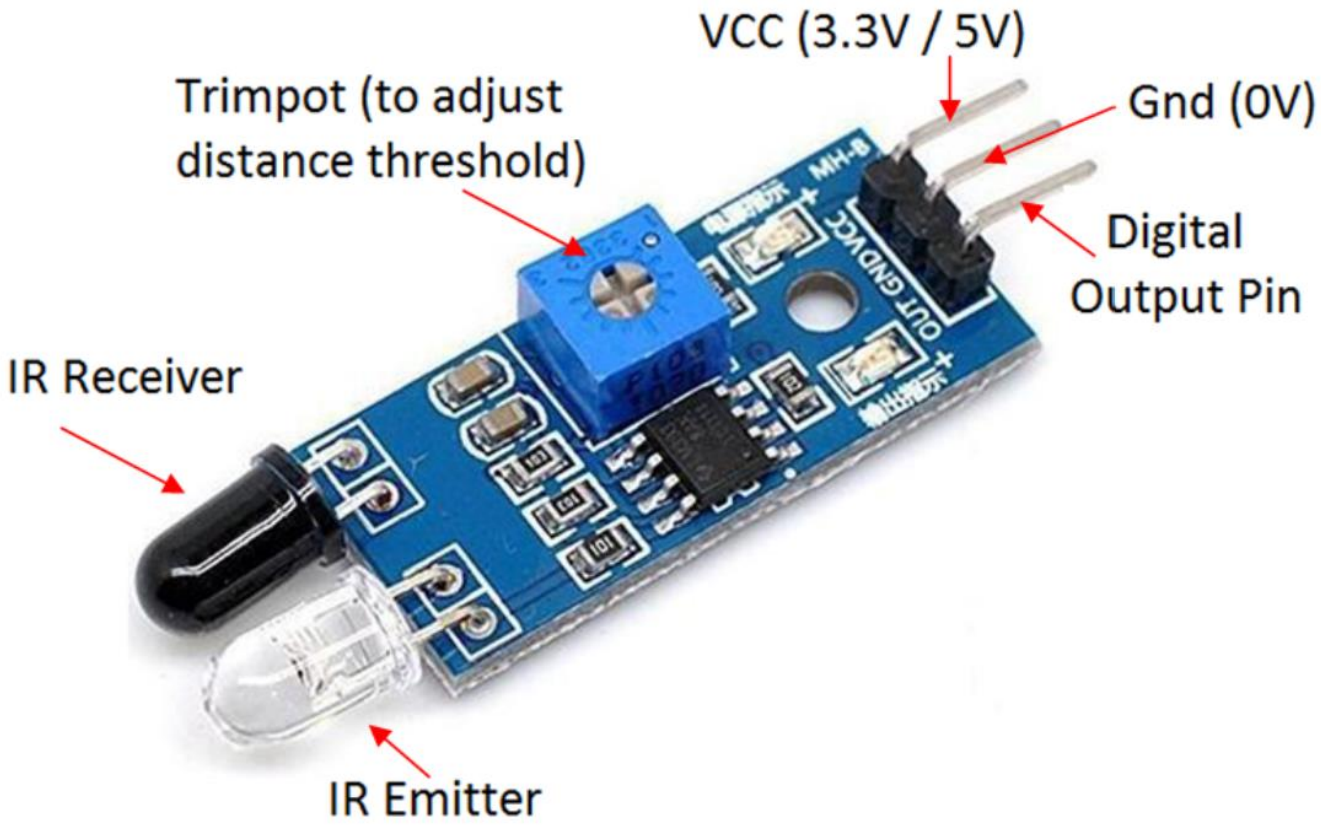
Keypad 4x4

- It is used for dialing in the password for the smart home.
- When entering a number code, it's tested whether it's correct or wrong
- If the user enters 3 wrong codes, the user will have to wait 5 seconds



Visitor Detection using Infrared Sensor

- We use an IR sensor around the door to detect potential visitors

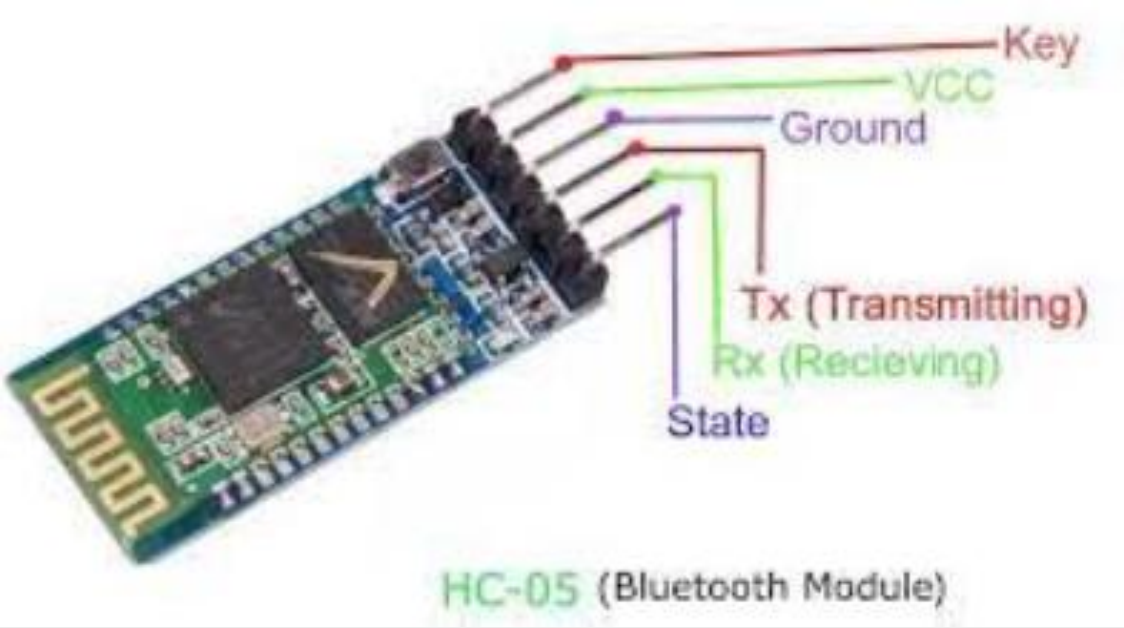


Servo Motor controlling door

- Once a user enters the correct password, the servo motor opens door.

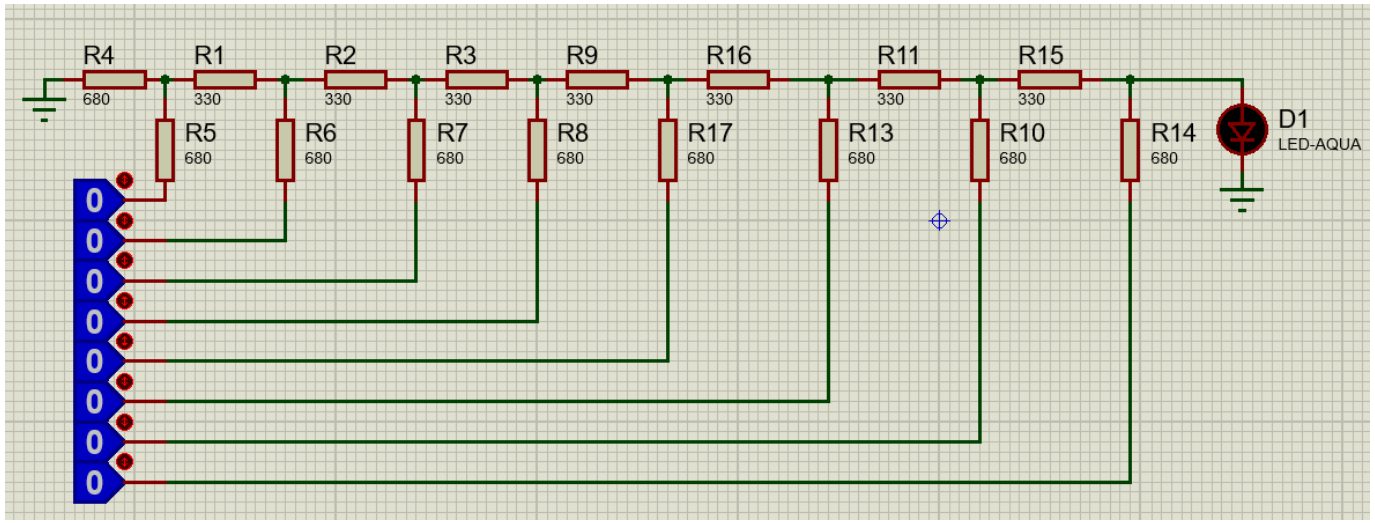
Bluetooth Module HC-05

- We use UART communication for receiving an operation number where:
- 1 : Toggle LED
- 2 : Change brightness LED
- 3 : Switch Fan
- 4 : Set Clock + the current time



R2R DAC Circuit

- The circuit is used to emulate a DAC using atmega16
- This is done by connecting a potentiometer to an ADC channel which controls the brightness of an LED.



6x 7-Segment displays

- We use 6 seven segment displays for the clock where there are two digits for each of hour, minute & second.