



Final Project

Embedded AVR Diploma

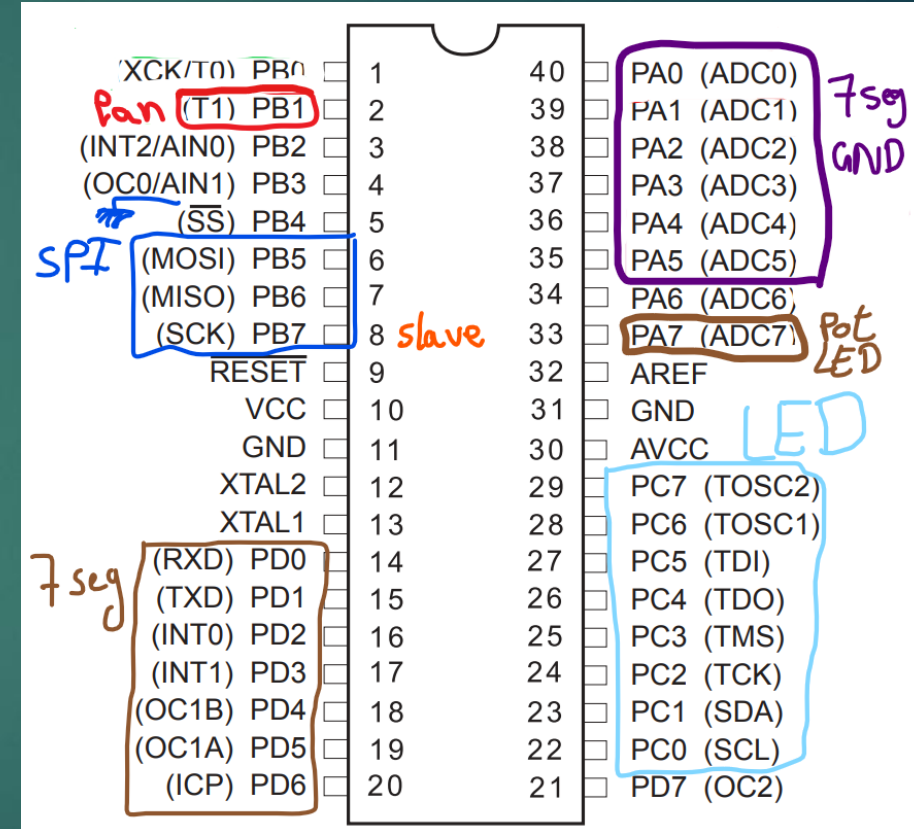
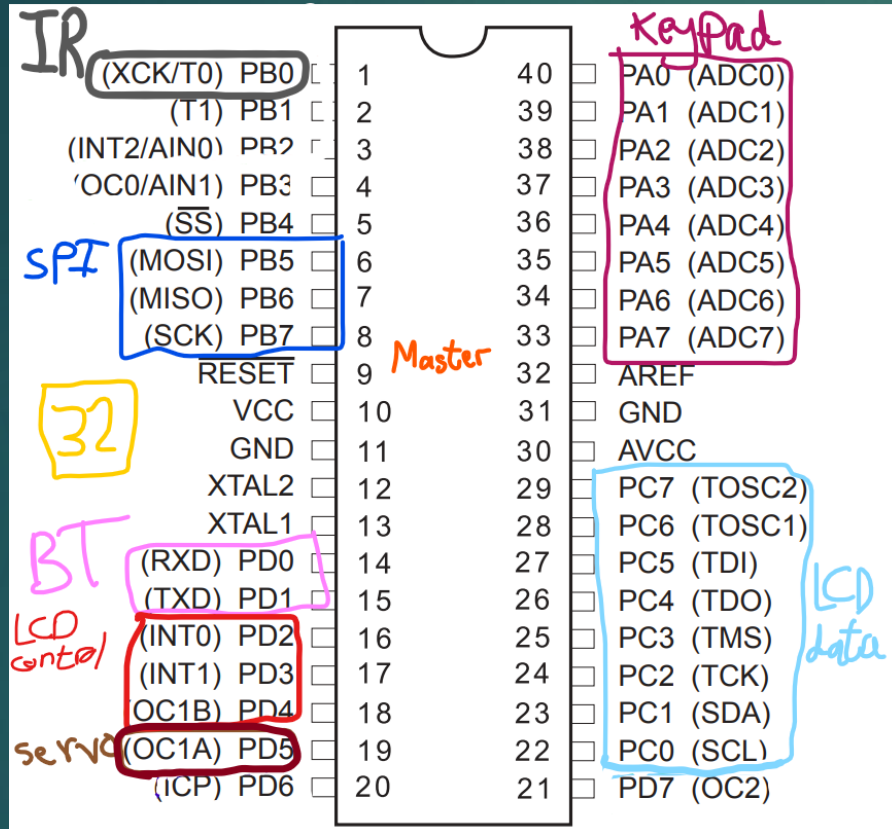
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Project Title : Bluetooth Controlled
Home

Circuit Connections



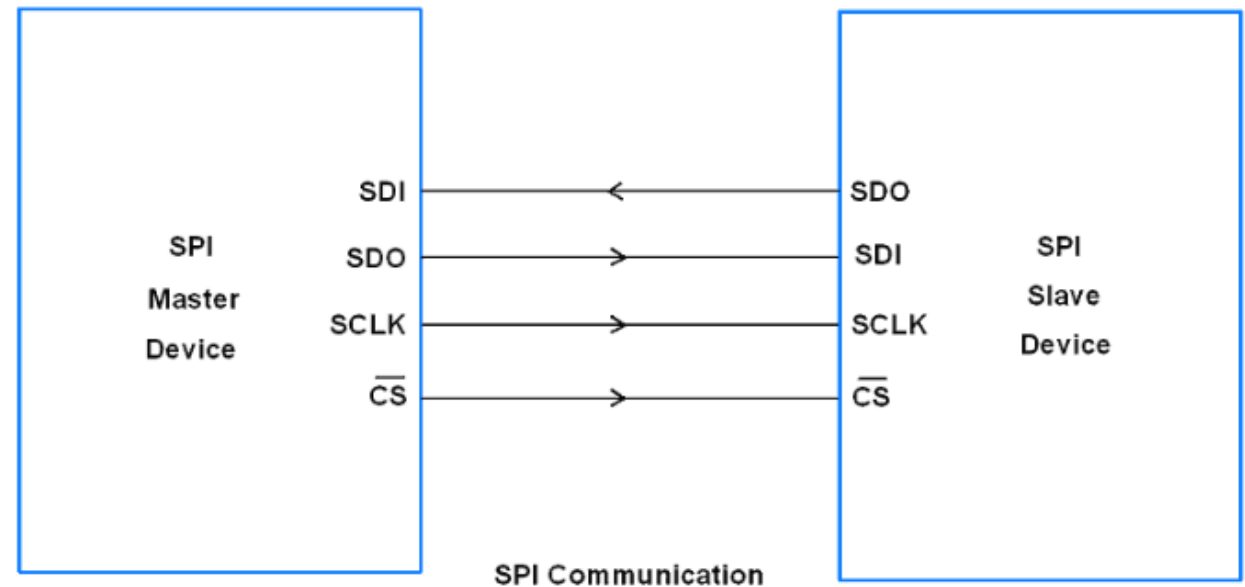
Some of the application and devices used:

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

Master – Slave

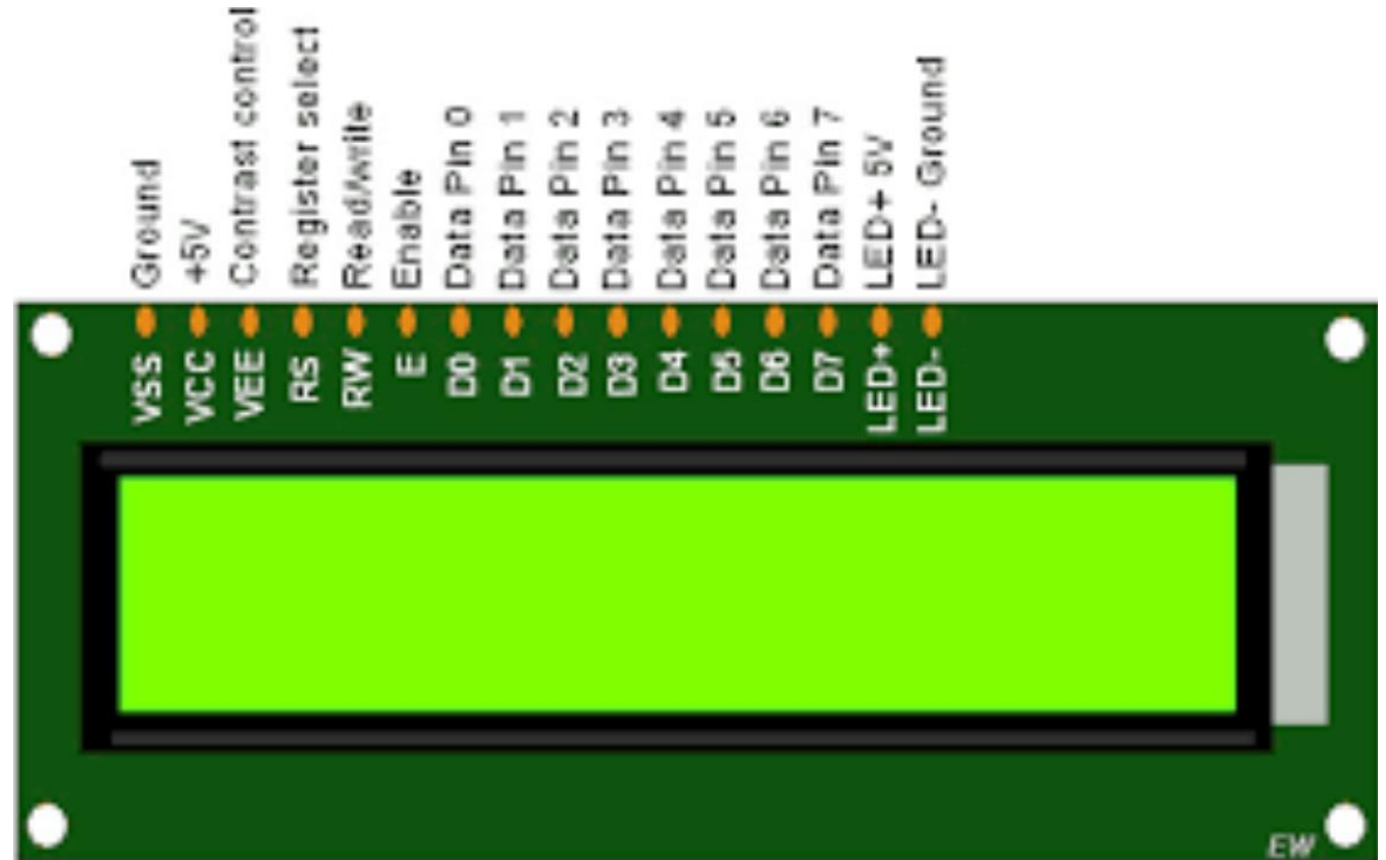
Atmega32 - Atmega16

- ▶ 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.



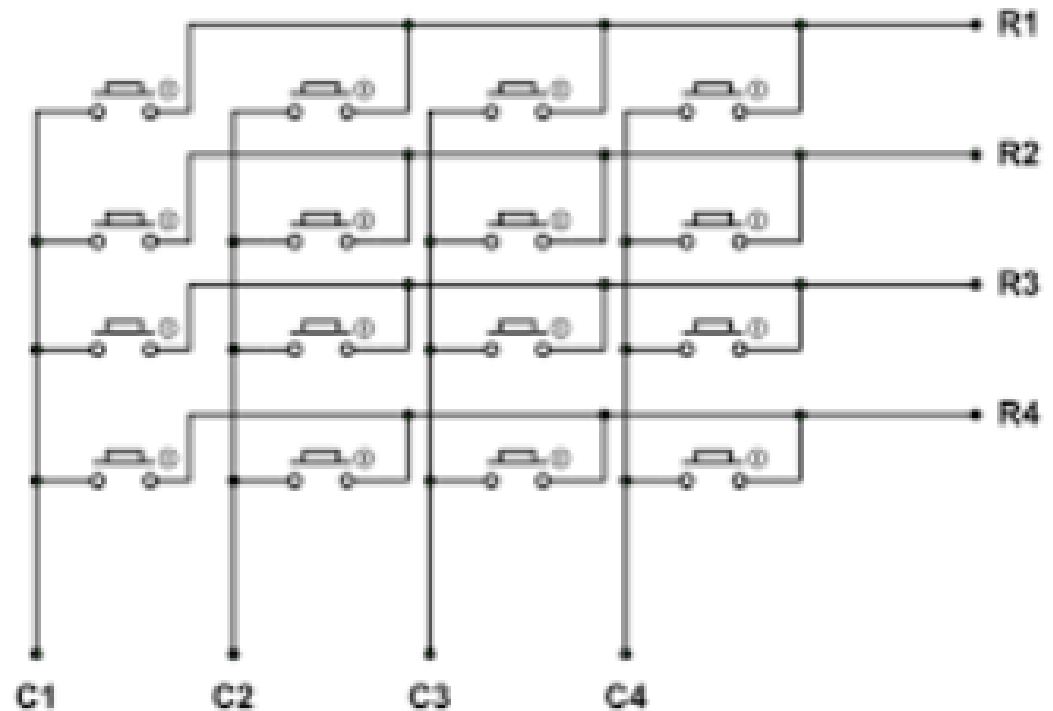
LCD Screen 16x2

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



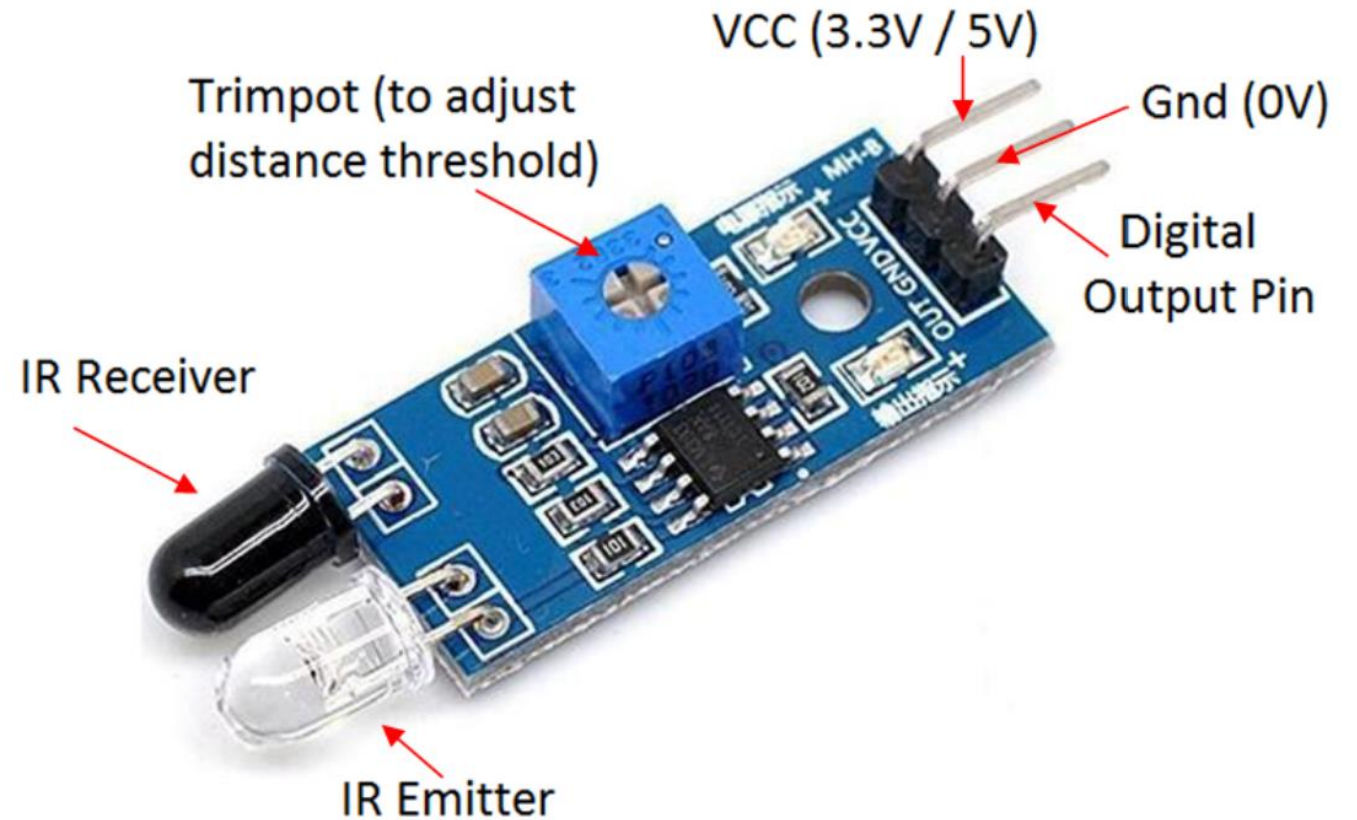
Keypad 4x4

- ▶ 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



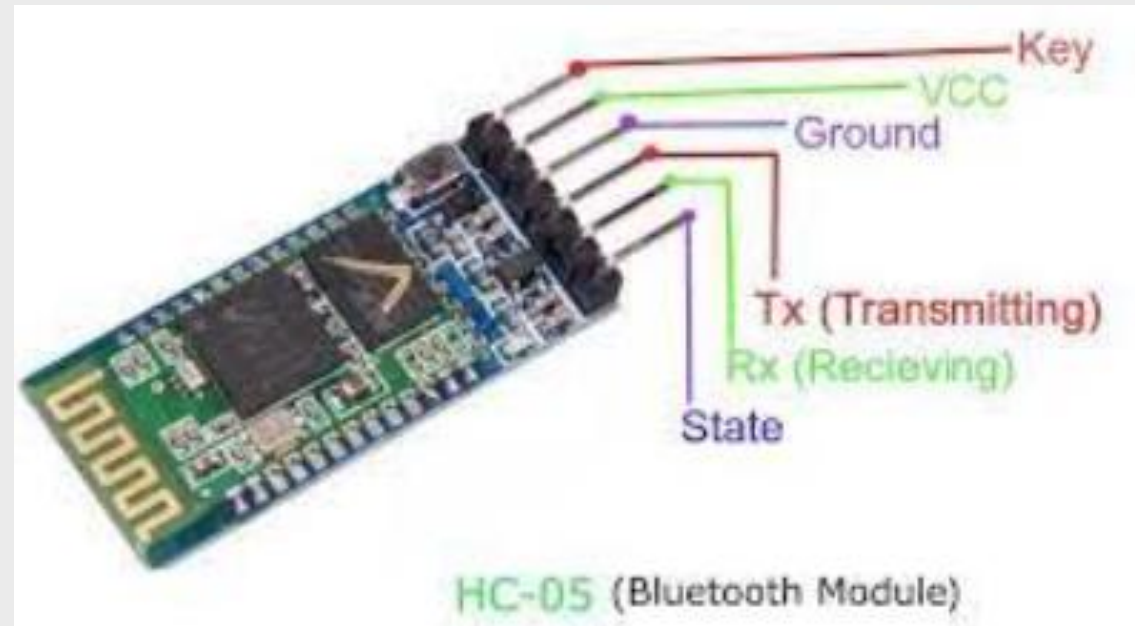
Servo Motor controlling door

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



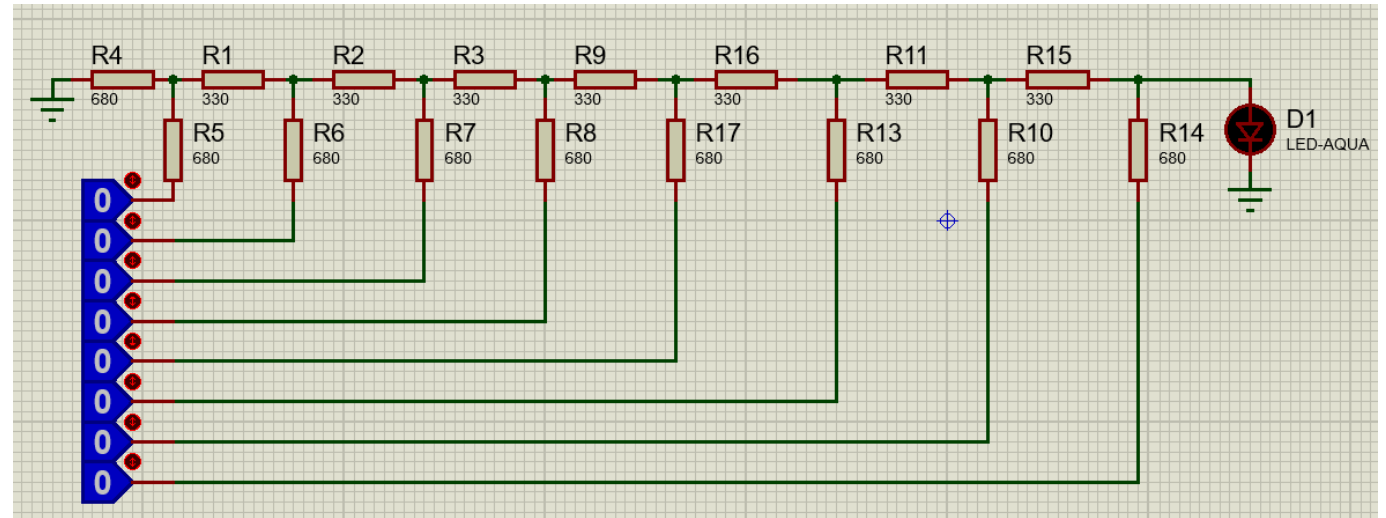
Bluetooth Module HC-05

- ▶ 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.

