Graphical user interface

Description automatically generated

Acknowledgements

Our appreciation goes to ***Engr Ibrar*** for guiding us through the project and to our colleagues of BEE-12D for their support. Special thanks to **Dr Arbab Latif**, all the YouTube channels such as RFID tutorials and ***Alsan Palaguli[[1]](#footnote-1)*** for clarifying our doubts against the local sever all its settings. In the end how can we forget our assistive seniors for providing us all the guidelines. As our project is basically consists of the sequential circuits so which is the last part of our semester it was a difficulty to make a project using the last concepts of the course so during various datasheets and open-source papers and platforms helped us a lot and we are abled to build a full flash project with the local server and its setting.

Abstract:

Radio frequency identification (RFID) is a prominent technology for a wide array of applications, from inventory tracking to payment processing. In the field of security, RFID door lock systems are utilized for access control, as they provide a reliable, consistent experience with trackable data. To function efficiently, an RFID door locking system requires RFID tags, antennas, an RFID reader, and a transceiver. In this system, the user's credential (usually a keycard or fob with an RFID chip) contains unique identifying information called a tag. Each RFID (Radio Frequency Identification Device) tag has a unique value. By doing this project we able to understand how to interface different modules with the atmega16A and how we can form our own simple microprocessor. This project is simple the advancement of the door locking system. As in this we used the database by using the Wi-Fi module and store the information of the cards that enter through this RFID sensor. Although we are facing some difficulties in interfacing the Arduino with the RFID MRC522, though this major problem is solved by consulting the NodeMCU which is responsible for setting up the local host with the PHP and MySQL database environment on our PC using the XAMPP platform.

Introduction:

This project is basically to control the door using the RFID Card module so that there is no external interference and in addition to that we must send data to the external local server using the XAMPP as for local server we have to set the PHP and the MySQL library in our PCs due to which we are using the XAMPP platform. So far, we have used the HTML, PHP and the AVR C programming to setup the RFID with the external server. By using the server we can register whether it is registered or not registered, so that we have 2 security check points the one thing is using the server and the other is by scanning the card and door will opens clearing the path.

Components:

|  |  |
| --- | --- |
| * Atmega 16A | * LED Lights |
| * RFID Module MRC522 | * Potentiometer |
| * LCD 16X2 Display | * Servo Motor |
| * NodeMCU ESP8266 Wifi Module | * Breadboard & Jumper Wires |
|  |  |

Software Used:

|  |  |
| --- | --- |
| * XAMPP (For local Server) | * Atmel Studio |
| * Arduino IDE | * Proteus |
|  |  |

Block Design:

Precautionary Measure:

***Basic operating conditions of the system:***

● Normal operating temperature - 25 ℃

● Supply voltage - 5V

● Listed parts in the previous text

***System safety requirements:***

● Do not expose to water surfaces

● Do not expose to high voltage

● Do not expose to high temperatures

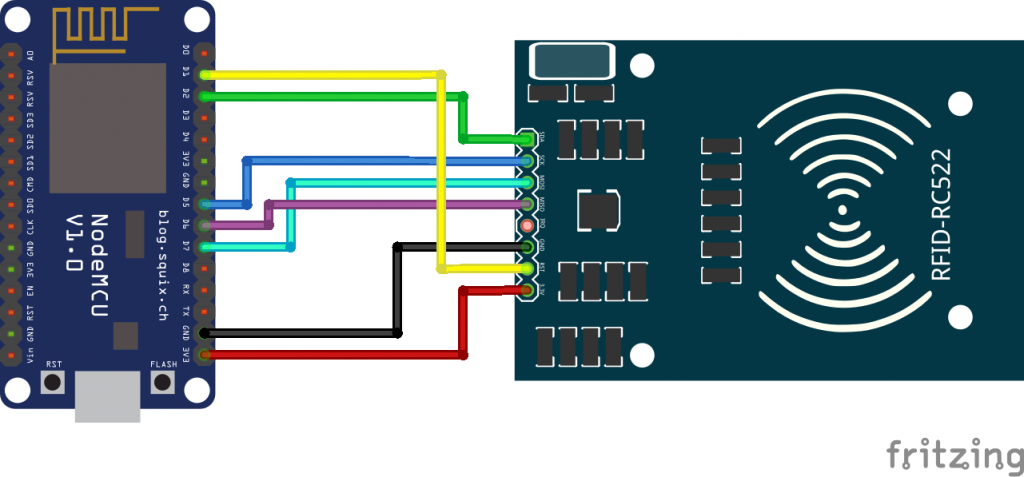
● Do not expose to strong compressive forces

● It is necessary to separate the parts from each other

● Avoid damage to the equipment

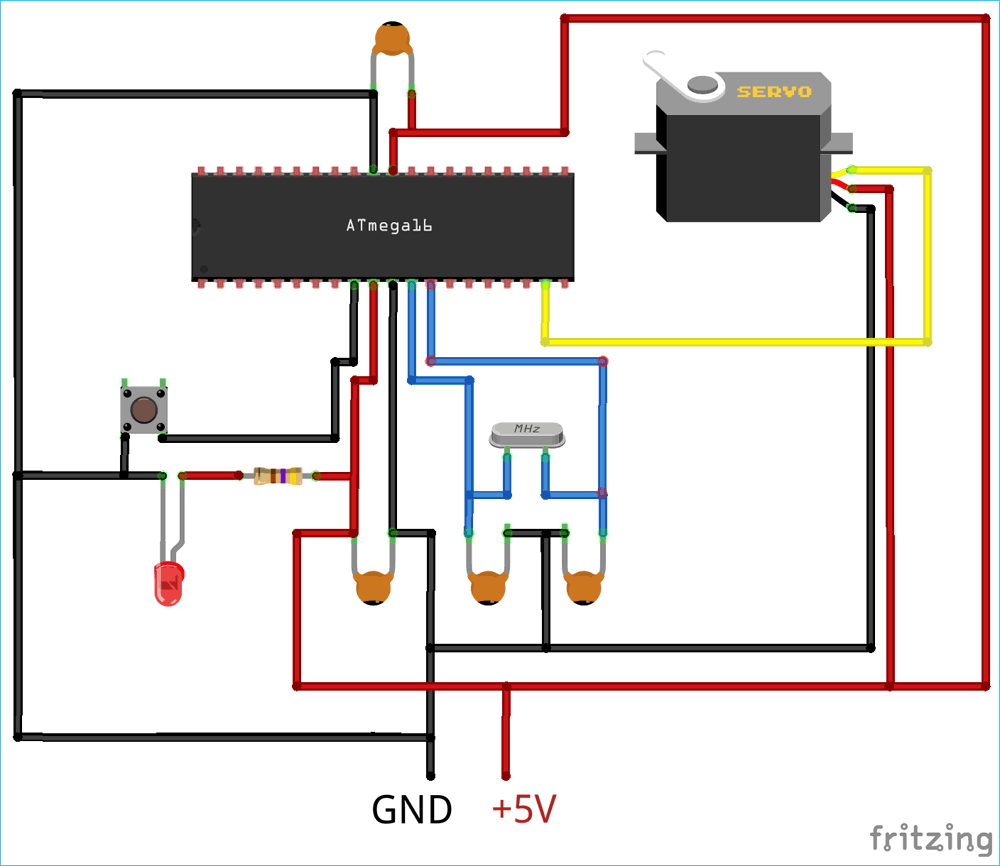
Hardware Design:

***Connection Between NodeMCU and RFID Reader***



RFID is connected with the NodeMCU to send the data to the atmega so that we can add the necessary instruction to the Atmel so that the door will open if an intruder enter with the card the alarm will clock.

***Connection Between Servo Motor and Atmega16A***



As when the NodeMCU sent the signal to the Atmega16A, the atmega16 done the computational analysis so that the specific operation can be made regarding the opening of the door using the servo motor.

Local Host SnapShots:

***Home:***

Graphical user interface

Description automatically generated

***User Data:***

Graphical user interface, text, website

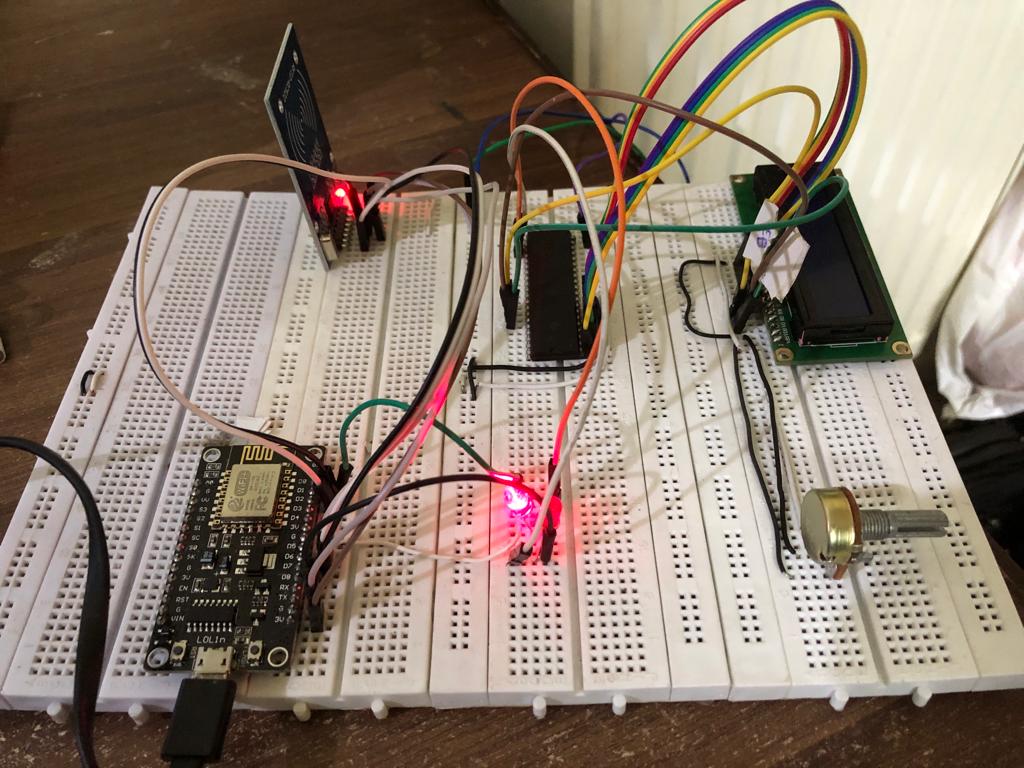
Description automatically generated

***Read UID Tag:***

Graphical user interface, website

Description automatically generated

Hardware Picture With Reader Module:



This is the circuit without the external door.

Future Recommendations:

Conclusion:

References:

Atmel - ATMega16A datasheet

● MFRC522 Contactless reader IC datasheet -

https://www.hobbytronics.co.uk/datasheets/sensors/MFRC522.pdf

https://www.hobbytronics.co.uk/mfrc522-reader

https://www.avrfreaks.net/forum/rfid-rc522-spi-and-atmega32a-initialisation https://randomnerdtutorials.com/security-access-using-mfrc522-rfid-reader-with-arduino/ https://github.com/miguelbalboa/rfid

https://github.com/asif-mahmud/MIFARE-RFID-with-AVR/tree/master/lib ● SPI - http://maxembedded.com/2013/11/the-spi-of-the-avr/

http://avrbeginners.net/architecture/spi/spi.html

https://www.electronicwings.com/avr-atmega/atmega1632-spi

http://www.firmcodes.com/microcontrollers/avr/spi-interfacing-with-atmega16/

[GitHub - SvenCelin/NFC-doorlock---atmega-16a: This project is made for Atmega 16a and Atmega 32.](https://github.com/SvenCelin/NFC-doorlock---atmega-16a)

1. [RFID-Attendance-system-V2.0/rfidattendance at master · InfinityWorldHI/RFID-Attendance-system-V2.0 · GitHub](https://github.com/InfinityWorldHI/RFID-Attendance-system-V2.0/tree/master/rfidattendance) [↑](#footnote-ref-1)