A
PROJECT REPORT ON

RFID AND IOT BASED ATTENDANCE MONITORING SYSTEM

Submitted to the Savitribai Phule Pune University,Pune In the Partial Fulfilment of the Requirements for the Award of the Degree

OF

BACHELOR OF ENGINEERING (ELECTRONICS AND TELECOMMUNICATION ENGINEERING)

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CERTIFICATE

This is to certify that the project report entitles "RFID and IOT Based Attendance Monitoring System"

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ABSTRACT

The RFID and ESP8266 based attendance monitoring system with the help of Google Sheet is a project that aims to automate the attendance process in Schools, Colleges and Organizations. The system uses an RFID reader to read the RFID tags of the students or employees and sends the data to the ESP8266 module.

The ESP8266 module is programmed to communicate with the Google sheet to store and retrieve attendance data. The system can be accessed from anywhere with an internet connection, making it easy for teachers or managers to view attendance records.

The project involves programming the RFID Reader and ESP8266 module, as well as setting up the Google Sheet to store and retrieve data. The system can provide accurate and efficient attendance management, reducing the workload of teachers or managers and ensuring records are up to date.

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List of Acronyms

- RFID-Radio Frequency Identification
- IOT-Internet of Things
- MFRC522-MIFARE Radio-Frequency Identification
- ESP8266-Espressif System's Protocol 8266
- UID-Unique Identifier
- UART-Universal Asynchronous Receiver/Transmitter
- MCU-Microcontroller Unit
- SPI-Serial Peripheral Interface
- MOSI-Master out Slave in
- MISO-Master in Slave out
- SCK-Serial Clock
- SS-Slave Select

Chapter 1

Introduction

One of the effective factor that support the system of presence of student. Because in many cases student often absent, so in traditional manual paper based attendance take too much time which is very time consuming, insecure and usually leads to human error.

Although work get wasted in organizing and structuring the attendance data in register in traditional method. Besides in many cases there are introduce proxy unauthorized person which leads to insecurities and misleading of organizing structure. As a result we present this system to overcome this different type of disadvantages. RFID (Radio Frequency Identification) technology has been revolutionized the way we track and manage data.

Once area where it has proven particularly useful in attendance monitoring system. In this system, RFID tags are used to identify and track individual as the person enter in bus and allowing only an authorized persons. In addition to allowing for accurate and efficient attendance recording with the help of Google Sheet. They mainly record related to authorized persons namely Date, Time and their name.

The particular system using RFID tags to track attendance and record it in Google Sheet. By accordingly the process, we can save the time and resources while ensuring accurate attendance records.

1.1 Motivation

The goal of RFID and IOT based Attendance Monitoring system is to provide an accurate, efficient and automated method for tracking attendance in various settings, such as Schools, Universities, Workplaces and events.

The systems aims to eliminate the need for manual attendance tracking method which can be time consuming and error phone. Instead the system uses RFID tags or cards and IOT devices to automatically capture attendance data in real time and also allowing administrators to access data instantly.

In addition to this system accurately capture attendance data, minimizing the potential for errors and ensuring that attendance records are reliable and trustworthy.

1.2 Problem Definition And Objectives

The problem the system aims to solve is the need for an efficient and accessible attendance tracking system that can be easily manages and monitored remotely. An RFID and IOT based Attendance Monitoring system using googlesheet is a technological solution desgned to track and manage attendance records in real time using googlesheet as the central database. They provide a reliable and efficient alternative, enabling automatic tracking and recording of attendance.

Objective behind this project work is to develop a system to provide and automated and efficient solution to attendance managemnt in various settings that simplifies attendance management, saves time and resources, improves accuracy and security.

1.3 Idea

Basically we target the student who are travelles through Bus. So but in many case there is most of possibility of person who don't have specific id or pass, because of this reason we face many problems. Like uncontrolled crowd because of this many of peoples who is legal for transportation they can't get sit and illegal person travels without transportation. So to

overcome this major Problem we are introduced our Project ”RFID and IOT based Attendance Monitoring System”. We can Definitely say that this dea can make our transportation flawless.

1.4 List of Papers Published

1. Miss.Poonam Devkar and Miss.Komal Walhekar and Miss.Payal Kanse and Mr.Sandeep Nalage,”RFID and IOT Based Attendance Monitoring System ” Published in JETIR(www.jetir.org)ISSN UGS Approved(Journal No:63975) Impact Factor Published in Volume 10, Issue 4, April-2023 Date of Publication-2023-04-30.

Chapter 2

Literature Survey

[1] The RFID automated Tracking attendance is presented Shashank Shukla, Pooja sore.The system then records the time and date of the attendance and sends the information to the instructor's computer for easy tracking and record-keeping

[2] RFID based system for school children Transportation safety is presented by Dr. Stya Shrikant, Shilpa Shree K. The objective of this paper is the technology being used to should be crucial enough to keep our society safe. To improve Transportation Safety.

[3] RFID It's used in Libraries is presented by Neeraj Kumar Singh. The aim of these are tagging books with RFID tags to quickly. Locate misplaced book on the shelves checkout.

[4] RFID based vehicle authentication using Smart card is presented by Litty Rajan, Alpana Gopi. The aim of this survey is to find RFID application in authentication of all vehicle during inspection.

Chapter 3

Methodology

3.1 Block Diagram

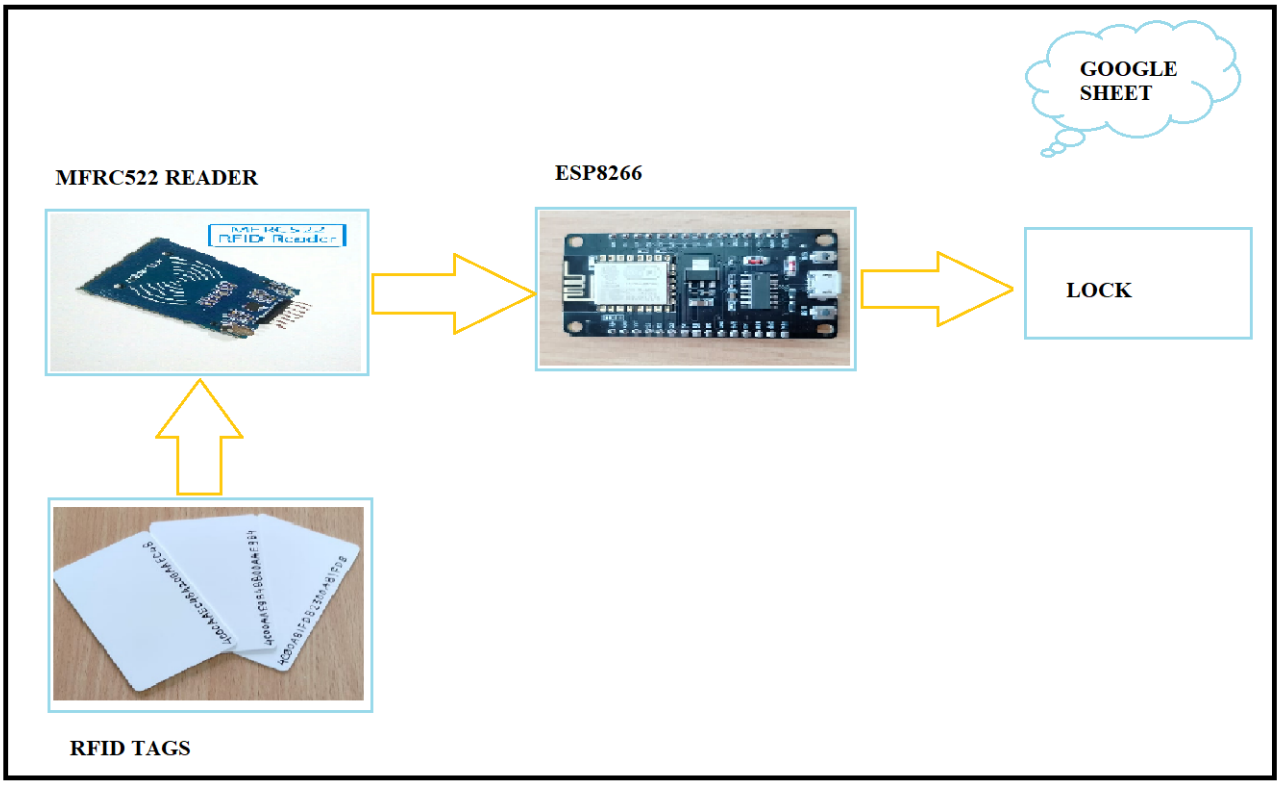


Figure 3.1: Proposed System Block Daigram

3.2 Block Diagram Explaination

A Passive tag is an RFID tag that does not contain an internal power source, such as battery instead of relies on the electromagnetic energy transmitted from an RFID reader to power the tags circuits. When a passive RFID tag enters the electromagnetic field of an RFID reader, it receives energy from the readers signal and uses the energy to power its internal circuits. The tag then modulates the signal to reflect its unique identification number back to the reader.

MFRC522 is a highly integrated chip for contactless communication at 13.56 MHz. The MFRC522 is commonly used in RFID reader applications for access control, identification. It's operate on 3.3V and communicates with Nodemcu through a standard SPI interface and receives the modulated signal and decodes the identification number to identify the tag. The MFRC522 chip is used to read and write data to RFID tags. It supports multiple communication modes, including the passive and active modes. It can detect and communicates with multiple tags simultaneously. MFRC522 is a versatile and popular chip for RFID reader applications. Easy to use and compatibility with RFID protocols. The ESP8266 is a small and affordable device that can connect to internet wirelessly.

The ESP8266 module built in wifi capabilities, making it easy to connect to the internet and communicate with other devices.ESP8266 module can be programmed using the Arduino Integrated Development Environment (IDE). They receive data from RFID reader and process on it. Furthermore match the data is stored on datasheet and received data from user. A Solenoid lock is an electromechanical device that uses a Solenoid, which is a coil of wire to control the locking mechanism. When an electric current flows through the solenoid coil, it generates a magnetic field that pulls a bolt, which is attached to the lock mechanism. This movement causes the lock to engage or disengage depending on its configuration. In case data is matched at that time the lock will be open for authorized person otherwise it remains close.

Google sheet is a free web based spreadsheet program provide by Google composing its Google Drive Service. It allows users to create and edit spreadsheet online while collaborating in real time with others. Along Google sheet, users can input and organize data perform analysis and create charts. The program assistance various data types including text, number and dates. As well as it can access their spreadsheet from any device with internet access.

Chapter 4

Hardware components

4.1 RFID Tags

Figure 4.1: RFID tags

A Passive tag is an RFID tag that does not contaion an internal power source, such as battery and instead relies on the electromagnetic energy transmitted from an RFID Reader to power the tags circuits. When passive RFID tag enters the electromagnetic field of an RFID reader, it receives energy from the readers signal and uses the energy to power its internal circuit. The tag then modulates the signal to reflect its unique identification number back to the reader. The reader receives the modulated signal and decodes the identification number to identify the tag. Passive tags are generally smaller and less expensive than active tags, making them more suitable for applications where the tags need to be disposal or where cost is a significant factor.

4.2 RFID Reader

The MFRC522 is a highly integrated RFID reader module that operates at 13.56 MHz frequency. It can read and write to RFID tags that comply with the ISO/IEC 14443A/MIFARE standard. The module communicates with a host microcontroller using a simple serial interface that supports SPI, I2C, and UART protocols.

The MFRC522 reader module consists of an analog front-end circuit, a digital processing block, and a host communication interface. The analog front-end circuit is responsible for transmitting and receiving signals between the reader and the RFID tag. The digital processing block includes a microcontroller unit (MCU) that performs the demodulation and decoding of the received signals. The host communication interface allows the reader module to communicate with a host microcontroller using a serial interface.

The MFRC522 reader module supports several operating modes, including idle, active, and sleep modes. In the idle mode, the reader is waiting for a tag to enter its field. In the active mode, the reader sends out a signal to activate the tag and start the communication. In the sleep mode, the reader is in a low-power state and consumes very little power.

The MFRC522 reader module also includes a number of features to enhance the security of the system. It includes a built-in cryptographic engine that supports several encryption algorithms, such as AES and DES. It also includes a unique identifier (UID) for each tag, which can be used to prevent unauthorized access to the system. Overall, the MFRC522 reader module is a powerful and versatile RFID reader that can be used in a wide range of applications, such as access control, ticketing, and asset tracking.

Features:

1. Low-cost method for reading passive RFID transponder tags.
2. 9600 bps serial interface.
3. 125 KHz Operating Frequency.
4. Reads EM4100 compatible transponders.
5. 64 bit Read Only (Manchester 64-bit, Modulus64).
6. Read Distance up to: 6 10cm for cards, and 5cm for key-tags.
7. On board LED (Green) for Pass indication.
8. On board Buzzer for Pass indication.
9. Integrated RFID Coil Antenna.
10. Serial UART out from pin headers (TTL/CMOS) and RS232 (DB9).

Figure 4.2: RC522 RFID Reader

4.3 ESP8266

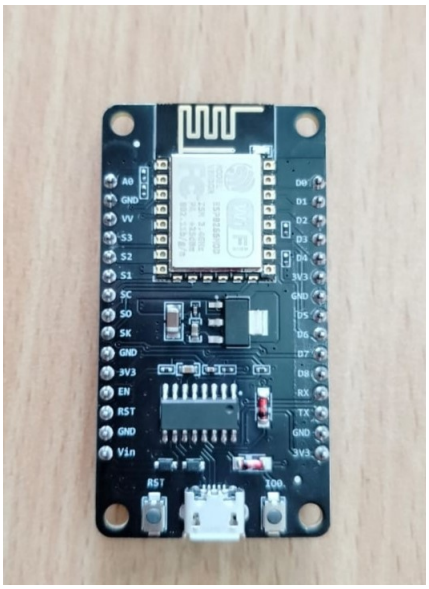


Figure 4.3: ESP8266 Module

Each student or employee is given an RFID card or tag that contains a unique identification number.

The ESP8266 module is connected to an RFID reader, which is used to read the unique identification number of the RFID card or tag when it is presented.

When the RFID card or tag is presented to the reader, the ESP8266 module receives the identification number and sends it to a server or cloud-based database.

The server or database records the time and date when the identification number was received, along with other relevant information such as the name of the student or employee.

The attendance records can then be accessed and analyzed by authorized personnel using a web or mobile application.

4.4 Solenoid Lock

An RFID reader is installed at the entrance of the attendance monitoring system. When a student or employee presents their RFID card or tag, the reader reads the unique identification number and sends it to the system's control unit.

The control unit then checks the identification number against the authorized list of users and grants access to the system if the user is authorized.

If access is granted, the control unit sends a signal to the solenoid lock to unlock the door or gate to the attendance monitoring system.

Once the user enters the system, their attendance record is automatically recorded based on their RFID identification number.

When the user leaves the system, the control unit sends a signal to the solenoid lock to lock the door or gate, preventing unauthorized access.

The use of a solenoid lock in an attendance monitoring system using RFID can help ensure that only authorized individuals are able to enter the system and access the attendance records. It can also help prevent unauthorized access and protect the privacy and security of the attendance data.

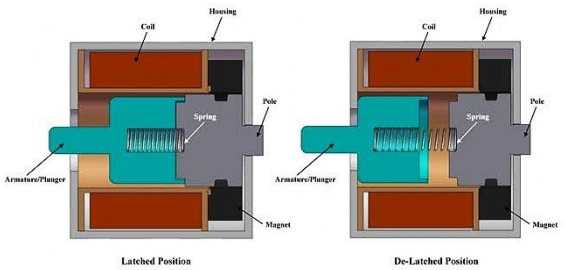


Figure 4.4: Solenoid Lock Mechanism

Chapter 5

Circuit Diagram

5.1 Circuit Diagram

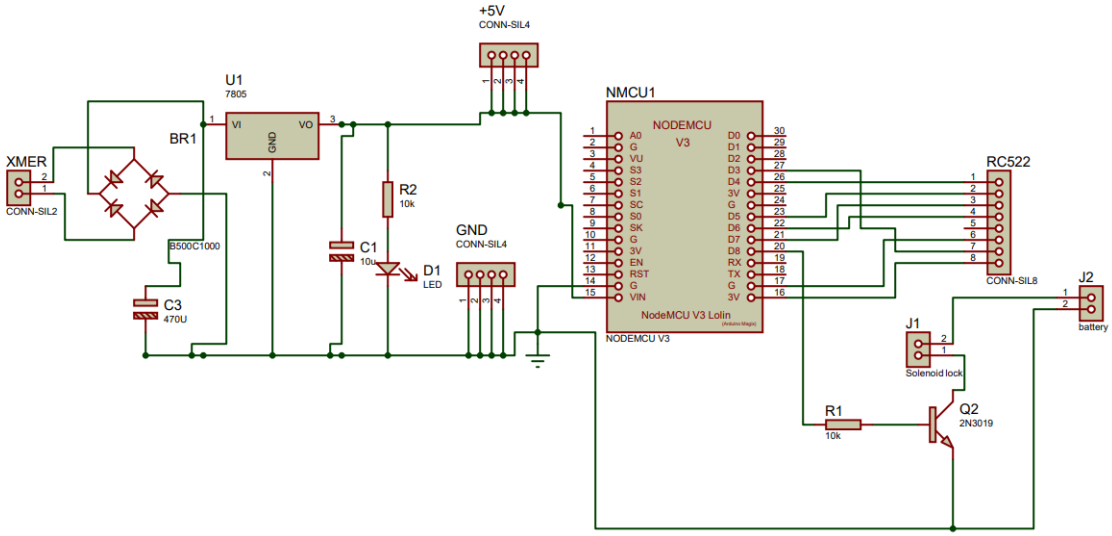


Figure 5.1: Proposed System Circuit Diaram

In the Circuit Diagram we using 5V power supply circuitary that means input voltage 5V is applied. Slave Select line is connected to D4 of nodemcu. It is serial clock pin used to provide clock source. SS acts as serial input for SPI communication.

Serial clock is connected to D5 of nodemcu. The clock pulses which synchronize data transmission generated by the controller and chip select pin(CS).

Master in Slave out is connected to D6 of nodemcu. It is SPI input to the RC522 module. Master out slave in is connected to D3 of nodemcu.

Reset pin connected to D3 of nodemcu. Most important the 3.3V is connected 3.3V pin and Ground also connected to Ground pin of nodemcu.

5.2 PCB Layout

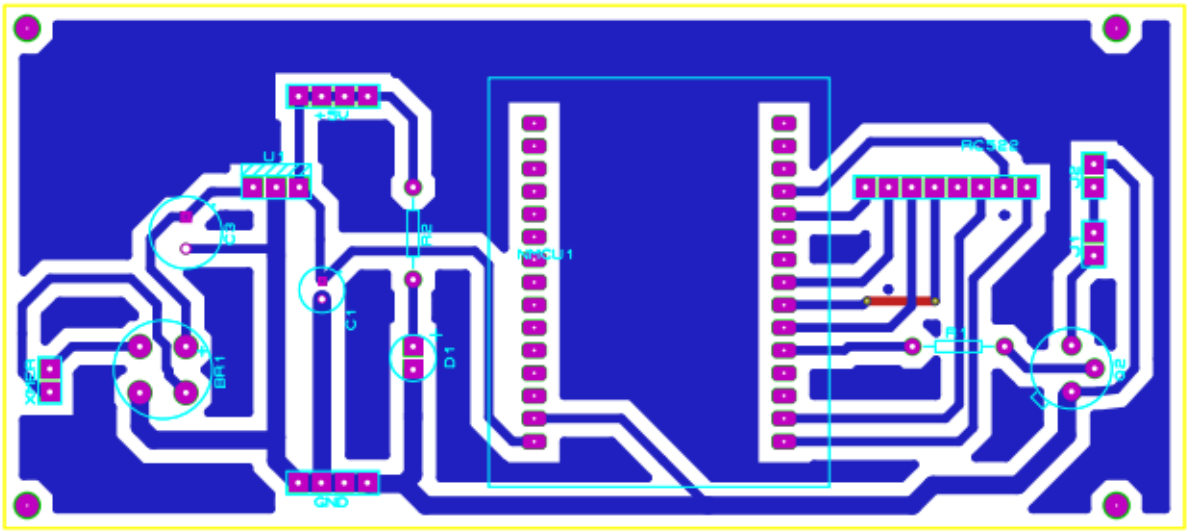


Figure 5.2: Proposed System PCB Layout

5.3 PCB Fabrication

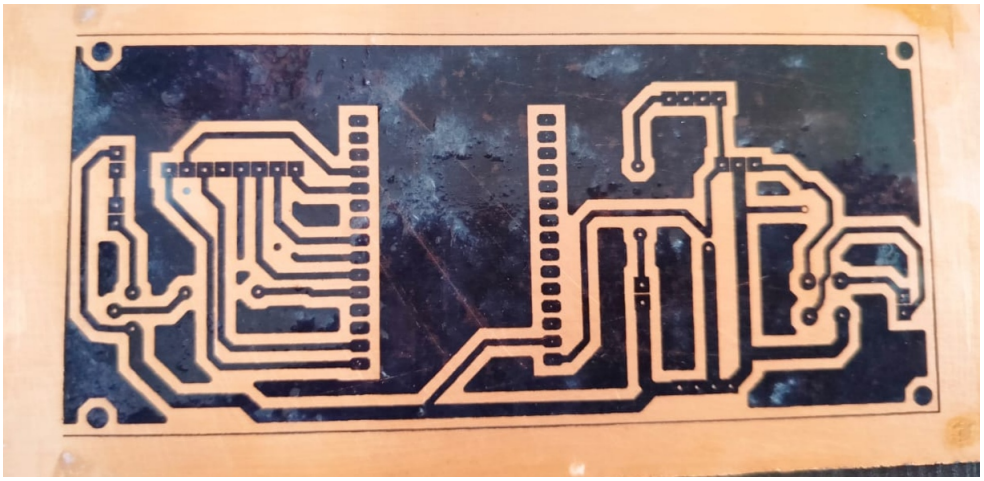


Figure 5.3: UV Explosion Processed PCB

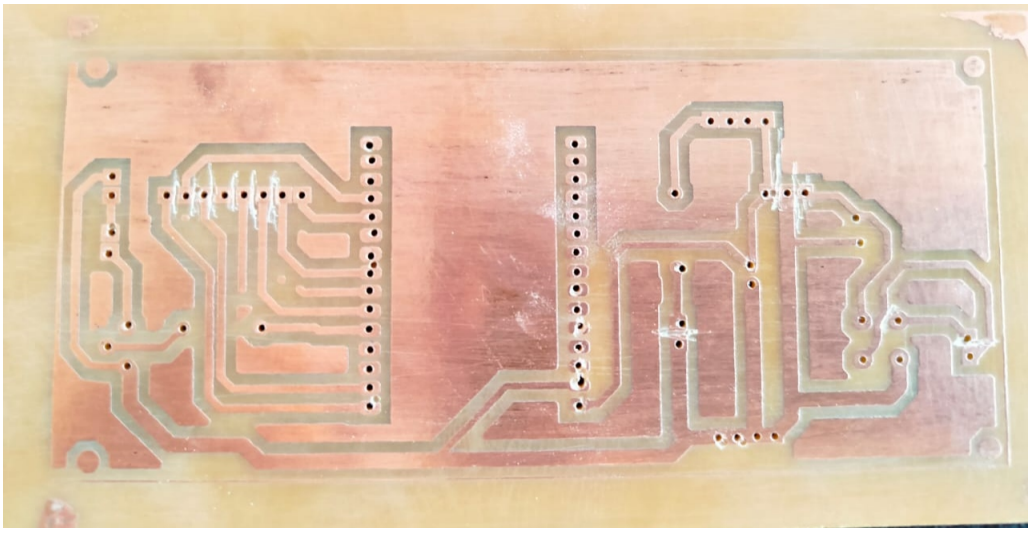


Figure 5.4: Etching Processed PCB

5.4 3D View

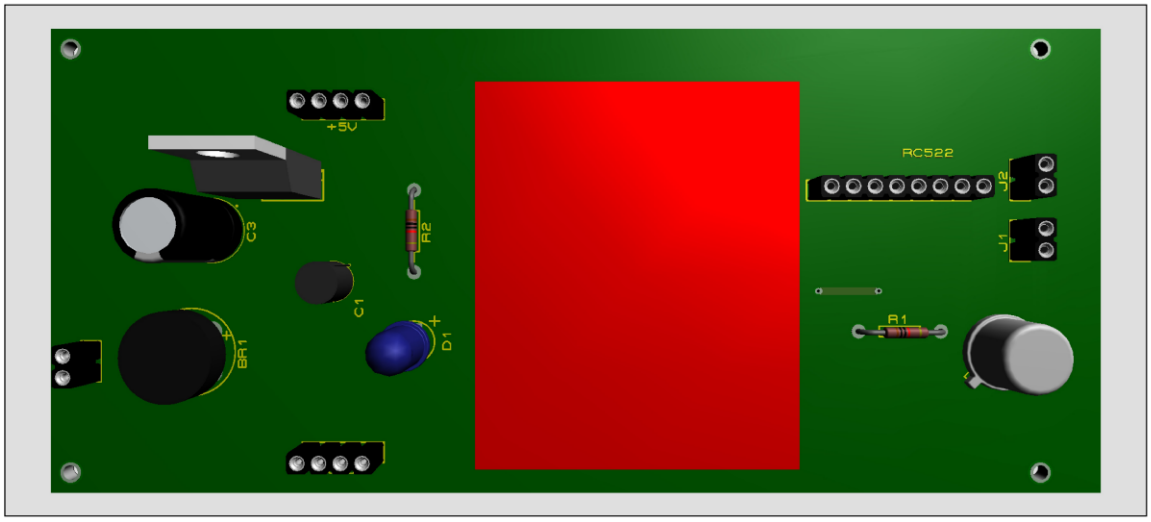


Figure 5.5: Top side View

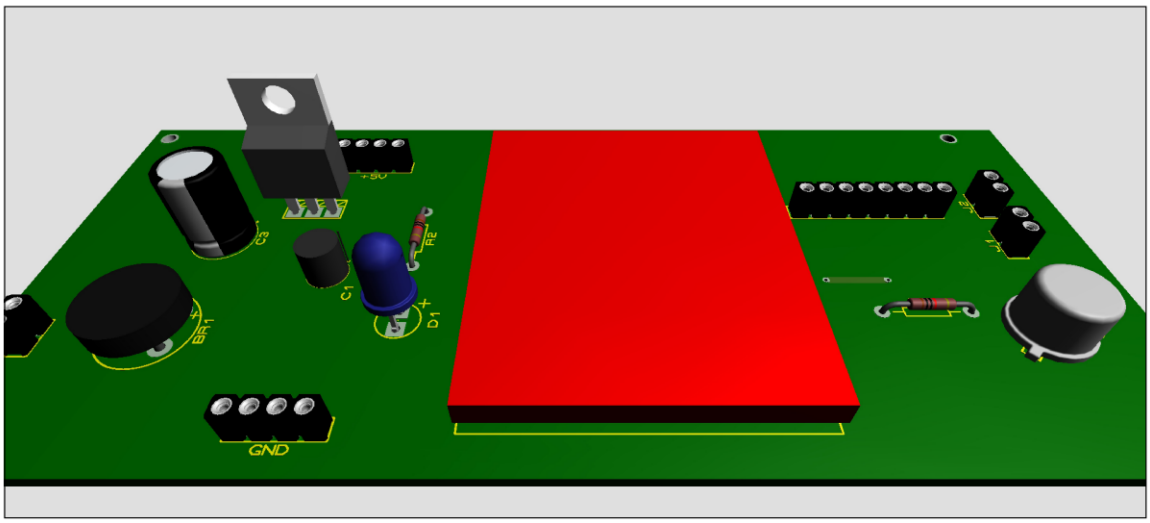


Figure 5.6: Front side View

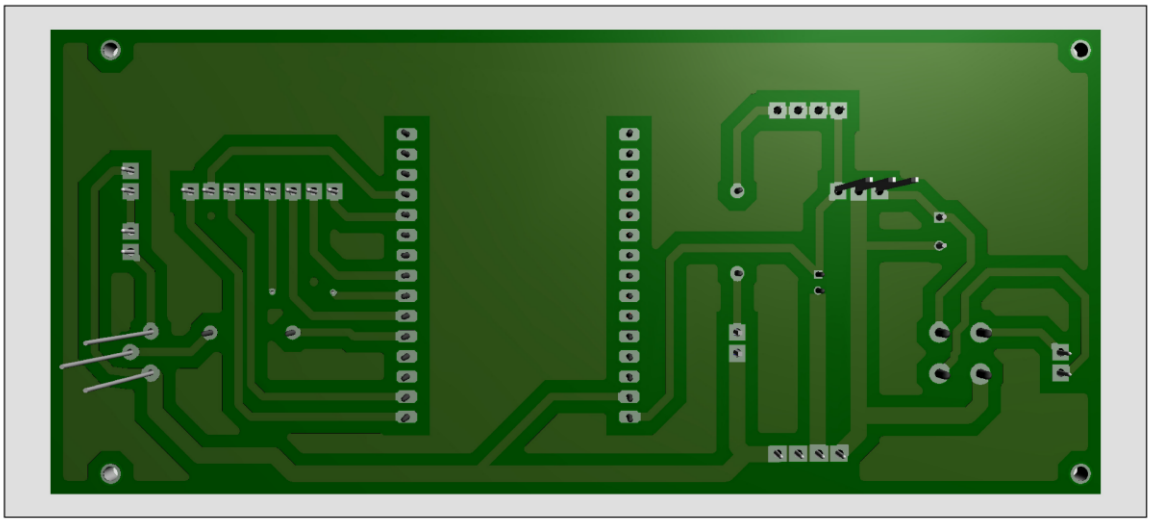


Figure 5.7: Back side View

Chapter 6

Attendance Record

6.1 Spreadsheet Code

6.1.1 Process of creating Googlesheet

First one is the spreadsheet code which is written on the back end of the spreadsheet. First, you need to create a Google account if you don't have one already.

Once you have a Google account, go to the Google Sheets homepage (https://www.google.com/sheets/about/) and click on the "Blank" or "Template" button to create a new Google Sheet.

Give your Google Sheet a name that is relevant to your attendance monitoring system, such as "Attendance Monitoring Sheet".

Choose Extensions and select a Appscript

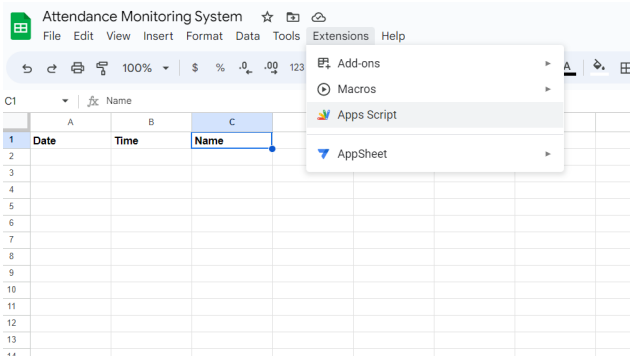


Figure 6.1: Step 1

Now enter the google appscript code in this and give the spreadsheet id.

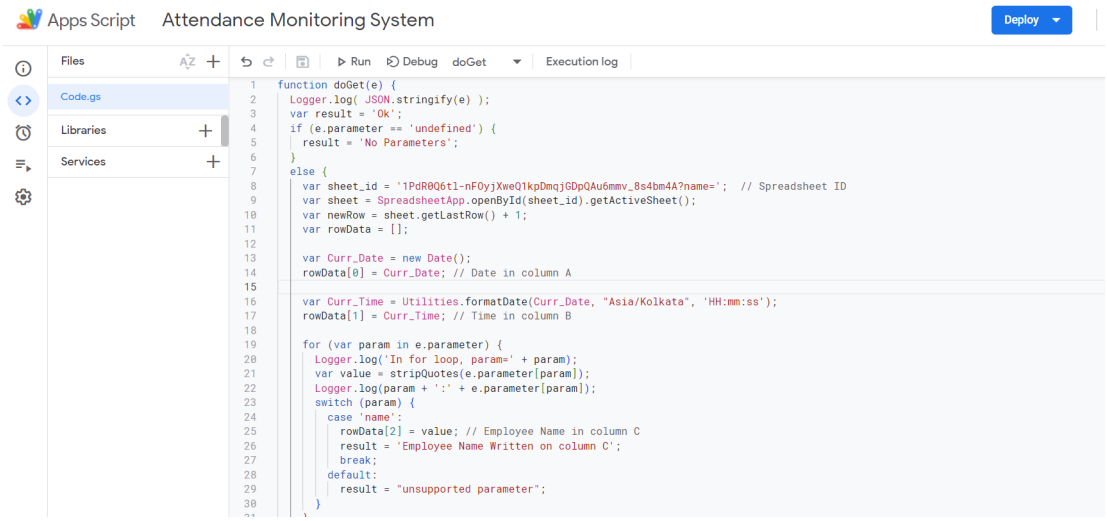


Figure 6.2: Step 2

After entering the spreadsheet id then deploy this code by using right side

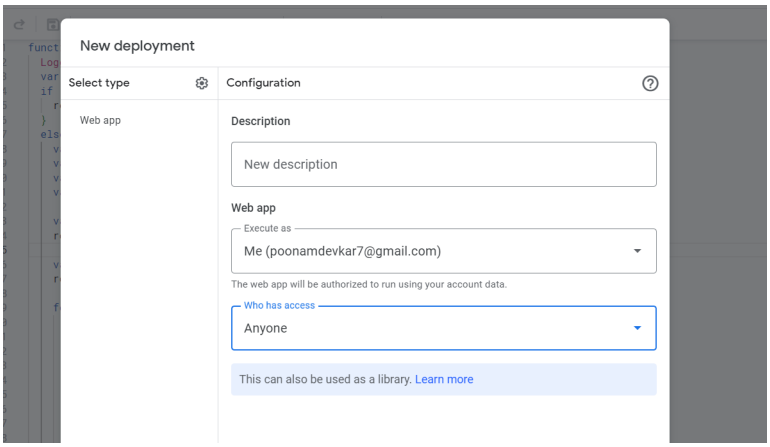


Figure 6.3: Step 3

And then give the Authorize access

Choose your google account

Choose Go to Attendance monitoring system(unsafe)

And last copy the URL code and enter in your code

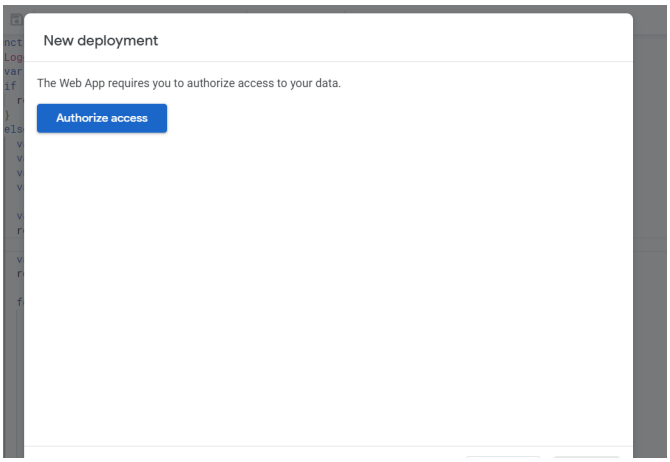


Figure 6.4: Step 4

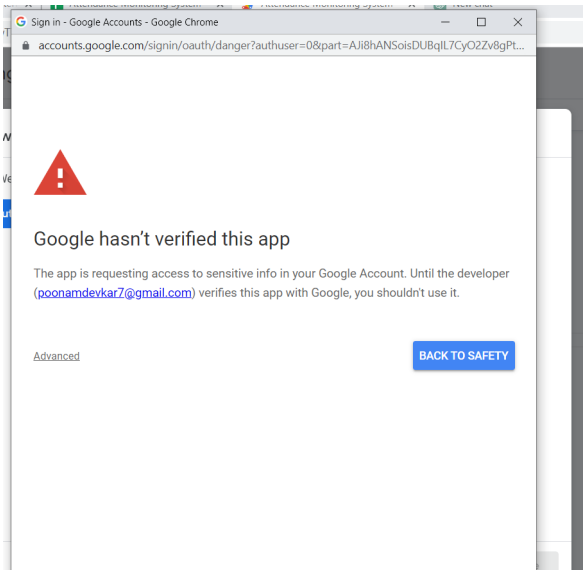


Figure 6.5: Step 6

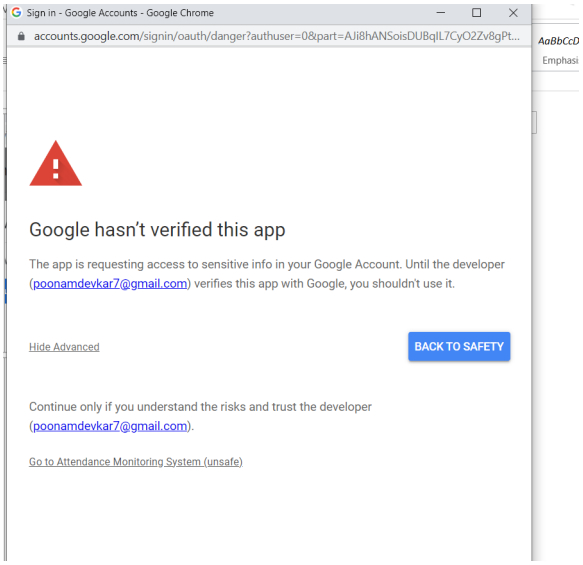


Figure 6.6: Step 7

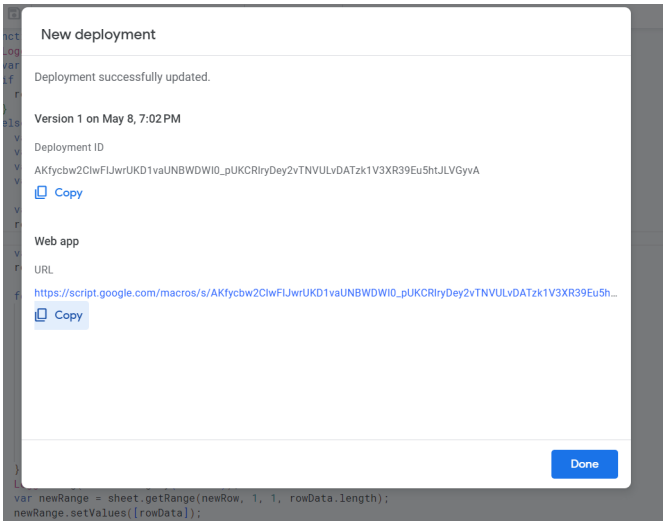


Figure 6.7: Step 8

6.1.2 Googlesheet Appscript Code

function doGet(e)
Logger.log(JSON.stringify(e));
var result = 'Ok';
if (e.parameter == 'undefined')
result = 'No Parameters';
else
var sheet$_id$ =''; //$SpreadsheetID$
$varsheet = SpreadsheetApp.openById(sheet_id).getActiveSheet();$
$varnewRow = sheet.getLastRow() + 1;$
$varrowData = [];$

var Curr$_D$$ate = newDate();$
$rowData[0] = Curr_Date; //DateincolumnA$

var Curr$_T$$ime = Utilities.formatDate(Curr_Date, "Asia/Kolkata",' HH :$
$mm : ss'$);
$rowData[1] = Curr_Time; //TimeincolumnB$

for (var param in e.parameter)
Logger.log('In for loop, param=' + param);
var value = stripQuotes(e.parameter[param]);
Logger.log(param + ':' + e.parameter[param]);
switch (param)
case 'name':
rowData[2] = value; // Employee Name in column C
result = 'Employee Name Written on column C';
break;
default:
result = "unsupported parameter";
Logger.log(JSON.stringify(rowData));
var newRange = sheet.getRange(newRow, 1, 1, rowData.length);
newRange.setValues([rowData]);

return ContentService.createTextOutput(result);
function stripQuotes(value)
return value.replace(/[$''$]|[$'"$]/g, "");

6.2 Tag assign Code

Second one is the code in which we will register the card by loading his/her information. That means that the card will be permanently assigned to the student/employee.

Set up the NodeMCU: Install the Arduino IDE and ESP8266 board support. Connect the NodeMCU to your computer using the USB cable and upload the necessary firmware.

Configure the RFID reader: Connect the RFID reader to the NodeMCU and configure it to read the RFID tag's unique identifier.

Connect to the internet: Configure the NodeMCU to connect to the internet using Wi-Fi or other means.

include ¡SPI.h¿
include ¡MFRC522.h¿

constexpr uint8$_t RST_PIN = D3; //Configurable, seetypicalpinlayoutabove$
$constexpruint8_t SS_PIN = D4; //Configurable, seetypicalpinlayoutabove$

MFRC522 mfrc522(SS$_P IN, RST_P IN$); $//Instanceoftheclass$
$MFRC522 :: MIFARE_K eykey$;

/* Set the block to which we want to write data */
/* Be aware of Sector Trailer Blocks */
int blockNum = 2;
/* Create an array of 16 Bytes and fill it with data */
/* This is the actual data which is going to be written into the card */
byte blockData [16] = "Poonam$_D evkar$";

/* Create another array to read data from Block */
/* Legthn of buffer should be 2 Bytes more than the size of Block (16 Bytes)
*/
byte bufferLen = 18;
byte readBlockData[18];

MFRC522::StatusCode status;

void setup()

/* Initialize serial communications with the PC */

```
Serial.begin(9600);
/* Initialize SPI bus */
SPI.begin();
/* Initialize MFRC522 Module */
mfrc522.PCD_Init();
Serial.println("ScanaMIFARE1KTagtowritedata...");


    void loop()

/* Prepare the ksy for authentication */
/* All keys are set to FFFFFFFFFFFFh at chip delivery from the factory
*/
for (byte i = 0; i ¡ 6; i++)

key.keyByte[i] = 0xFF;

/* Look for new cards */
/* Reset the loop if no new card is present on RC522 Reader */
if ( ! mfrc522.PICC_IsNewCardPresent())
return;

    /* Select one of the cards */
if ( ! mfrc522.PICC_ReadCardSerial())
return;
Serial.print("");
Serial.println("**CardDetected**");
/*PrintUIDoftheCard*/
Serial.print(F("CardUID:"));
for(bytei = 0; i < mfrc522.uid.size; i++)
Serial.print(mfrc522.uid.uidByte[i] < 0x10?"0":""); Serial.print(mfrc522.uid.uidByte[i], HE
Serial.print("");
/*Printtypeofcard(forexample, MIFARE1K)*/
Serial.print(F("PICCtype:"));
MFRC522::PICC_TypepiccType = mfrc522.PICC_GetType(mfrc522.uid.sak);
Serial.println(mfrc522.PICC_GetTypeName(piccType));

    /* Call 'WriteDataToBlock' function, which will write data to the block
*/
Serial.print("");
Serial.println("Writing to Data Block...");
```

WriteDataToBlock(blockNum, blockData);

/* Read data from the same block */
Serial.print("");
Serial.println("Reading from Data Block...");
ReadDataFromBlock(blockNum, readBlockData);
/* If you want to print the full memory dump, uncomment the next line */
//mfrc522.PICC$_DumpToSerial((mfrc522.uid))$;

/* Print the data read from block */
Serial.print("");
Serial.print("Data in Block:");
Serial.print(blockNum);
Serial.print(" –¿ ");
for (int j=0 ; j¡16 ; j++)

Serial.write(readBlockData[j]);

Serial.print("");

void WriteDataToBlock(int blockNum, byte blockData[])

/* Authenticating the desired data block for write access using Key A */
status = mfrc522.PCD$_Authenticate(MFRC522 :: PICC_CMD_MF_AUTH_KEY_A, blockNum, key,$
$(mfrc522.uid))$;
$if(status != MFRC522 :: STATUS_OK)$
$Serial.print("Authentication failed for Write : "); Serial.println(mfrc522.GetStatusCodeNam$
$else$
$Serial.println("Authentication success");$

/* Write data to the block */
status = mfrc522.MIFARE$_Write(blockNum, blockData, 16)$;
$if(status != MFRC522 :: STATUS_OK)$
$Serial.print("Writing to Block failed : "); Serial.println(mfrc522.GetStatusCodeName(status)$
$else$
$Serial.println("Data was written into Block successfully");$

void ReadDataFromBlock(int blockNum, byte readBlockData[])

/* Authenticating the desired data block for Read access using Key A */

status = mfrc522.PCD$_{A}uthenticate(MFRC522 :: PICC_{C}MD_{M}F_{A}UTH_{K}EY_{A}, blockNum, key,$
$(mfrc522.uid))$;

if (status != MFRC522::STATUS$_{O}K$)
$Serial.print(”Authenticationfailedfor Read : ”); Serial.println(mfrc522.GetStatusCodeName$
$else$
$Serial.println(”Authenticationsuccess”)$;

/* Reading data from the Block */
status = mfrc522.MIFARE$_{R}ead(blockNum, readBlockData, bufferLen)$;
$if(status! = MFRC522 :: STATUS_{O}K)$
$Serial.print(”Readingfailed : ”); Serial.println(mfrc522.GetStatusCodeName(status)); retur$
$else$
$Serial.println(”Blockwasreadsuccessfully”)$;

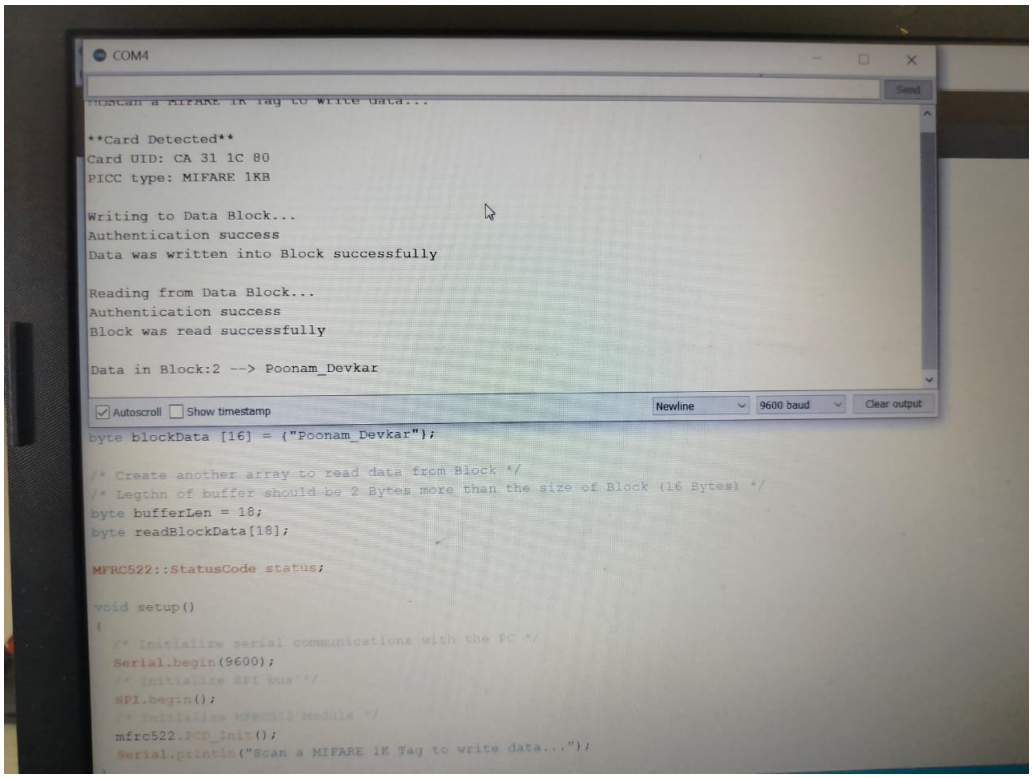


Figure 6.8: Successfully Assigned name

6.3 Main Code

include ¡SPI.h¿
include ¡MFRC522.h¿
include ¡Arduino.h¿
include ¡ESP8266WiFi.h¿
include ¡ESP8266WiFiMulti.h¿
include ¡ESP8266HTTPClient.h¿
include ¡WiFiClient.h¿
include ¡WiFiClientSecureBearSSL.h¿

// Fingerprint for demo URL, expires on July 17, 2023, needs to be updated well before this date
const uint8$_t fingerprint[20] = 0x5d, 0xba, 0x19, 0xa5, 0x81, 0x25, 0x05, 0x32, 0x72, 0x13, 0xa7, 0x$

define RST$_P IND3//Configurable, seetypicalpinlayoutabove$
$defineSS_P IND4//Configurable, seetypicalpinlayoutabove$
$defineBUZZERD2//Configurable, seetypicalpinlayoutabove$
$defineLOCK_P IND8//Configurable, seetypicalpinlayoutabove$

MFRC522 mfrc522(SS$_P IN, RST_P IN$); $//Instanceoftheclass$
$MFRC522 :: MIFARE_K eykey$;
$ESP8266WiFiMultiWiFiMulti$;
$MFRC522 :: StatusCodestatus$;

/* Be aware of Sector Trailer Blocks */
int blockNum = 2;

/* Create another array to read data from Block */
/* Length of buffer should be 2 Bytes more than the size of Block (16 Bytes)
*/
byte bufferLen = 18;
byte readBlockData[18];

String data2;
const String data1 = " ";

// Array of authorized data
String authorizedData[] =
"Poonam$_D evkar$",
"$Komal_W alhekar$",

"$Person3$",
"$Person4$",
"$Person5$",
"$Person6$",
"$Person7$",
"$Person8$",
"$Person9$",
"$Person10$"
;

void setup()

/* Initialize serial communications with the PC */
Serial.begin(9600);
// Serial.setDebugOutput(true);

Serial.println();
Serial.println();
Serial.println();

for (uint8$_t t = 4; t > 0; t--$)
$Serial.printf$("[$SETUP$]$WAIT$$Serial.flush$(); $delay$(1000);

WiFi.mode(WIFI$_S TA$);

/* Put your WIFI Name and Password here */
WiFiMulti.addAP("Redmi Y2", "deva@123");

/* Set BUZZER and LOCK$_P INasOUTPUT*/
$pinMode(BUZZER, OUTPUT)$;
$pinMode(LOCK_PIN, OUTPUT)$;

/* Initialize SPI bus */
SPI.begin();

void loop()

/* Initialize MFRC522 Module */
mfrc522.PCD$_I nit$();
$/*Lookfornewcards*/$

/ ∗ ResetttheloopifnonewcardispresentonRC522Reader ∗ /
$if(!mfrc522.PICC_IsNewCardPresent())$
return;
/ ∗ Selectoneofthecards ∗ /
$if(!mfrc522.PICC_ReadCardSerial())$
return;
/ ∗ Readdatafromthesameblock ∗ /
$Serial.println()$;
$Serial.println(F("Readinglastdatafrom RFID..."))$;
$ReadDataFromBlock(blockNum, readBlockData)$;
/ ∗ Ifyouwanttoprintthefullmemorydump, uncommentthenextline ∗ /
$//mfrc522.PICC_DumpToSerial((mfrc522.uid))$;

/* Print the data read from block */
Serial.println();
Serial.print(F("Last data in RFID:"));
Serial.print(blockNum);
Serial.print(F(" –¿ "));
for (int j = 0; j ¡ 16; j++)

Serial.write(readBlockData[j]);

Serial.println();
digitalWrite(BUZZER, HIGH);
delay(200);
digitalWrite(BUZZER, LOW);
delay(200);
digitalWrite(BUZZER, HIGH);
delay(200);
digitalWrite(BUZZER, LOW);

// Check if the data read from the RFID card is authorized
bool isAuthorized = false;
String dataString((char*)readBlockData);
for (int i = 0; i ¡ 10; i++)
if (dataString == authorizedData[i])
isAuthorized = true;
break;

```
    if (isAuthorized)
digitalWrite(LOCK_PIN, HIGH); //SettheLOCK_PINtoHIGH
delay(10000); //KeeptheLOCK_PINHIGHfor10seconds
digitalWrite(LOCK_PIN, LOW); //SettheLOCK_PINbacktoLOW


    // wait for WiFi connection
if (WiFiMulti.run() == WL_CONNECTED)
std :: unique_ptr < BearSSL :: WiFiClientSecure > client(new BearSSL :: WiFiClientSecure
    client-¿setFingerprint(fingerprint);
// Or, if you're happy to ignore the SSL certificate, then use the
following line instead:
// client-¿setInsecure();

    data2 = data1 + String((char *)readBlockData);
data2.trim();
Serial.println(data2);

    HTTPClient https;
Serial.print(F("[HTTPS] begin..."));
if (https.begin(*client, (String)data2))

// HTTP
Serial.print(F("[HTTPS] GET..."));
// start connection and send HTTP header
int httpCode = https.GET();

    // httpCode will be negative on error
if (httpCode ¿ 0)

// HTTP header has been sent and Server response header has been
handled
Serial.printf("[HTTPS] GET... code: // file found at server

else

Serial.printf("[HTTPS] GET... failed, error:
https.end();
delay(1000);

else
```

Serial.printf("[HTTPS] Unable to connect");

void ReadDataFromBlock(int blockNum, byte readBlockData[])

/* Prepare the key for authentication */
/* All keys are set to FFFFFFFFFFFFh at chip delivery from the factory
*/
for (byte i = 0; i ¡ 6; i++)

key.keyByte[i] = 0xFF;

/* Authenticating the desired data block for Read access using Key A */
status = mfrc522.PCD$_{A}uthenticate(MFRC522 :: PICC_{C}MD_{M}F_{A}UTH_{K}EY_{A}$,
$blockNum, key, (mfrc522.uid))$;

if (status != MFRC522::STATUS$_{O}K$)
$Serial.print("Authentication failed for Read : "); Serial.println(mfrc522.GetStatusCodeName$
$else$
$Serial.println("Authentication success");$
$/ * Reading data from the Block * /$
$status = mfrc522.MIFARE_{R}ead(blockNum, readBlockData, bufferLen);$
$if(status! = MFRC522 :: STATUS_{O}K)$
$Serial.print("Reading failed : "); Serial.println(mfrc522.GetStatusCodeName(status)); retur$
$else$
$Serial.println("Block was read successfully");$

Chapter 7

Result and Discussion

7.1 Module Testing

Module testing is one of important phase in this project. The main objective on running this testing is to ensure that all the module are in good condition and working as expected. The module involes are RFID Reader and ESP8266 module.

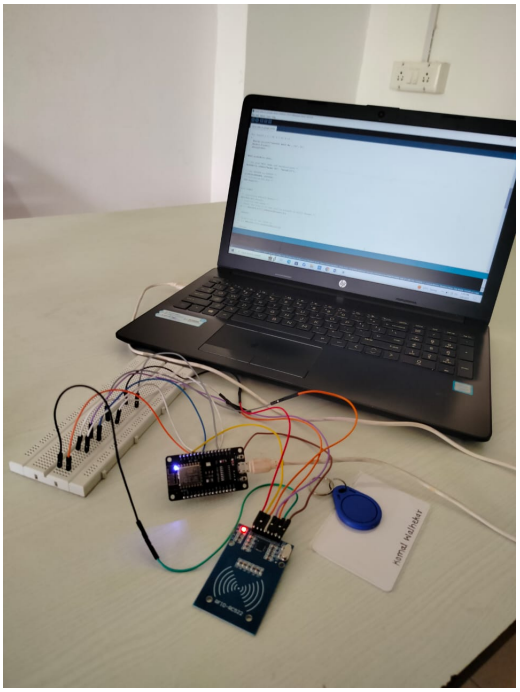


Figure 7.1: RFID Reader and ESP8266 module

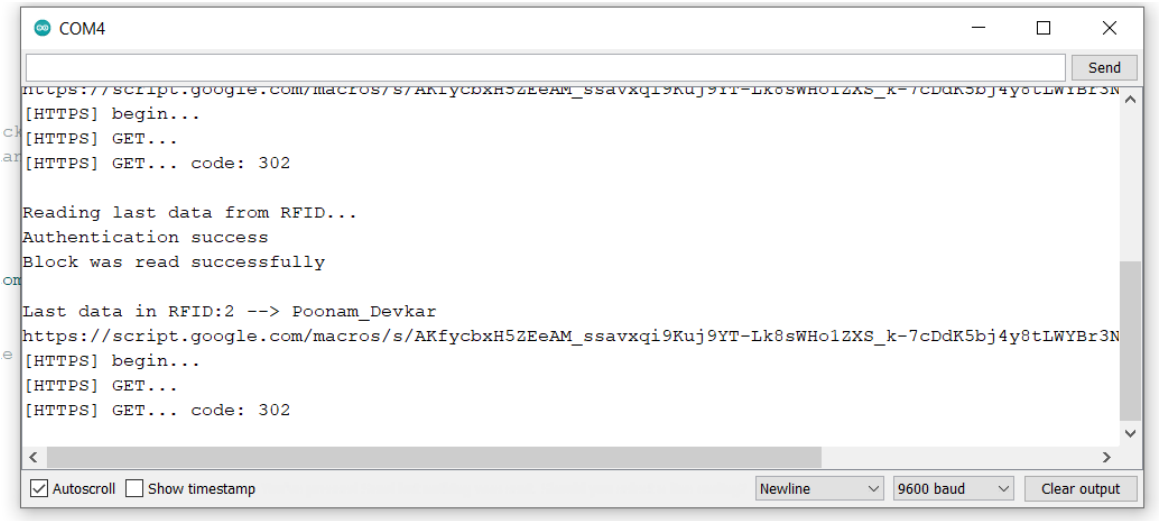


Figure 7.2: Serial Monitor Display

The figure shows Serial Monitor Display the data successfully send to googlesheet.

7.1.1 Software Flowchart

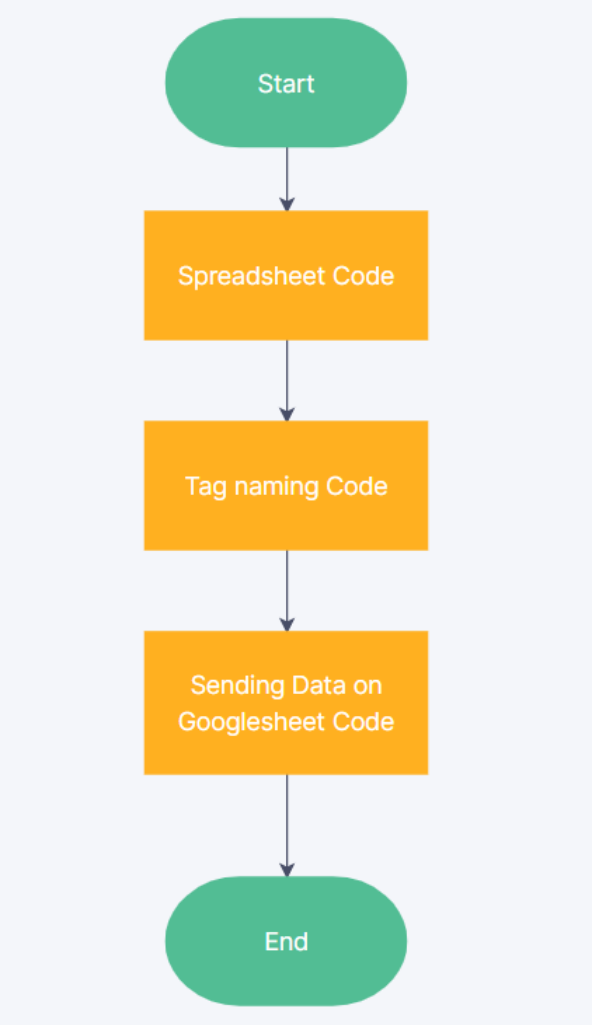


Figure 7.3: Flowchart of Code used

7.1.2 Hardware Flowchart

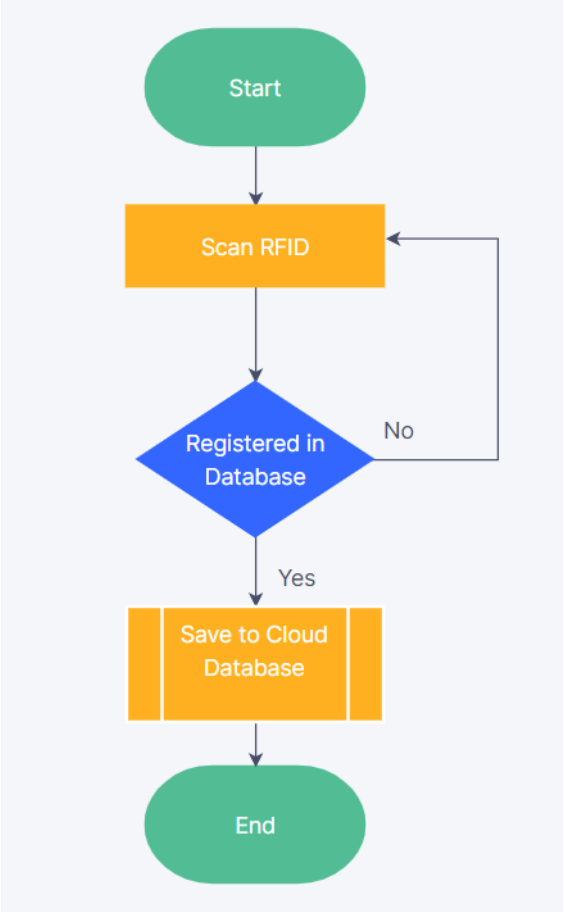


Figure 7.4: Flowchart of Final RFID Integration

RFID card is detected by the reader module if it in the range of 10 cm. RFID reader is responsible for communication between itself and RFID tags in its range which decode the data encoded in the RFID tag and passes the data further processing. ESP8266 receives data from RFID reader and process on it. They match the data is stored on database and received data from user. In case data is matched at that time the lock will be open for authorized person otherwise it remains close. Ultimately the attendance data will be stored on cloud (Google sheet).

7.2 Prototype Development

7.2.1 Initial Phase

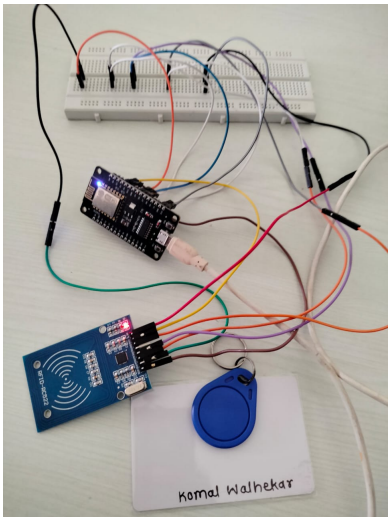


Figure 7.5: Hardware Installation of Initial Prototype

The figure shows the initial prototype of hardware installation which is focusing more on software development of this project.

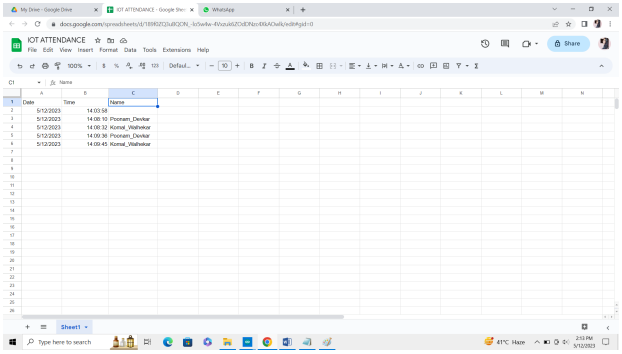
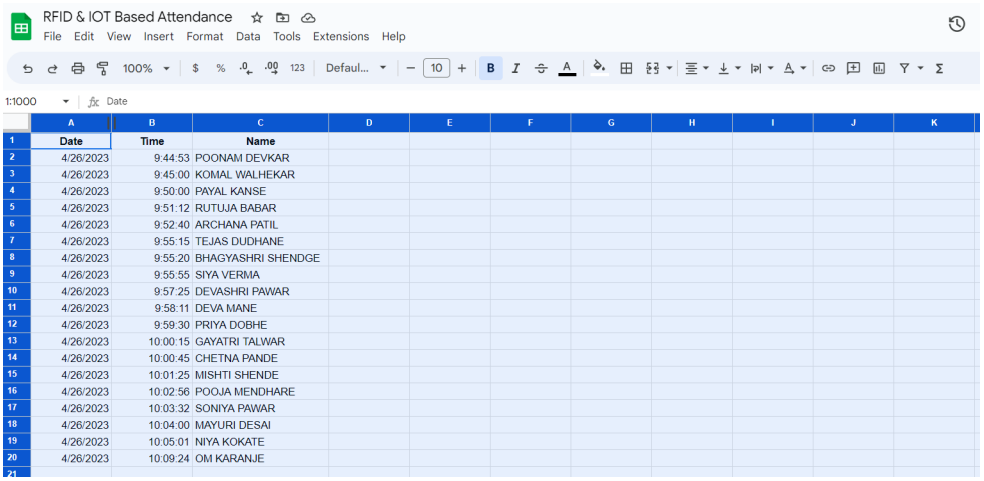


Figure 7.6: Testing Result

7.2.2 Output



	A	B	C
1	Date	Time	Name
2	4/26/2023	9:44:53	POONAM DEVKAR
3	4/26/2023	9:45:00	KOMAL WALHEKAR
4	4/26/2023	9:50:00	PAYAL KANSE
5	4/26/2023	9:51:12	RUTUJA BABAR
6	4/26/2023	9:52:40	ARCHANA PATIL
7	4/26/2023	9:55:15	TEJAS DUDHANE
8	4/26/2023	9:55:20	BHAGYASHRI SHENDGE
9	4/26/2023	9:55:55	SIYA VERMA
10	4/26/2023	9:57:25	DEVASHRI PAWAR
11	4/26/2023	9:58:11	DEVA MANE
12	4/26/2023	9:59:30	PRIYA DOBHE
13	4/26/2023	10:00:15	GAYATRI TALWAR
14	4/26/2023	10:00:45	CHETNA PANDE
15	4/26/2023	10:01:25	MISHTI SHENDE
16	4/26/2023	10:02:56	POOJA MENDHARE
17	4/26/2023	10:03:32	SONIYA PAWAR
18	4/26/2023	10:04:00	MAYURI DESAI
19	4/26/2023	10:05:01	NIYA KOKATE
20	4/26/2023	10:09:24	OM KARANJE
21			

Figure 7.7: Student's Database Window (Master Database)

Chapter 8

Conclusion and Future Scope

8.1 Conclusion

Figure 8.1: Smart Attendance System

This project is a full system for student monitoring in colleges and high education institutes. The device is supported with friendly using software for data analysis and previewing. Attendance data now easily uploaded to database.

8.2 Future Scope

Voice announcement system. No matter when a user logs in, we can announce messages such as,“ your attendance has been logged in” or “your card is invalid”.
The structure can be upgraded by surrounding it in a cling wrap. Previously mentioned might make it more compact and easier lecture-wise attendance taking.
It could be modernize by impulsive manipulates attendance percentage of students along with staff.

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