MAJOR PROJECT

RFID Based Attendance System with tomatoes

Submitted in partial fulfillment of the requirements
for the award of the degree of

Bachelor of Technology
in
Electronics & Communication

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DECLARATION

We, student(s) of B.Tech (ECE) hereby declare that the major project entitled "**RFID Based Attendance System with Live Tracking and Database**" which is submitted to Department of Electronics & Communication, HMR Institute of Technology & Management, Hamidpur Delhi, affiliated to Guru Gobind Singh Indraprastha University, Dwarka(New Delhi) in partial fulfillment of requirement for the award of the degree of Bachelor of Technology in ECE, has not been previously formed the basis for the award of any degree, diploma or other similar title or recognition. The list of member(s) involved in the project is listed below: -

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ACKNOWLEDGEMENT

The success and final outcome of this project required a lots of guidance and assistance from many people and we are extremely privileged to have got this all along the completion of my project. All that we have done is only due to such supervision and assistance and we would not forget to thank them.

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At last, we are in debt of our friends & family members who have provided us constant support and motivation throughout time to complete our project.

ABSTRACT

In recent years, there have been rise in the number of applications based on Radio Frequency Identification (RFID) systems and have been successfully applied to different areas as diverse as transportation, health-care, agriculture, and hospitality industry to name a few. RFID technology facilitates automatic wireless identification using electronic passive and active tags with suitable readers. In this Project, we have made an attempt to solve recurrent lecture attendance monitoring problem in developing countries using RFID and wireless technology. The application of RFID to student attendance monitoring as developed and deployed in this study is capable of eliminating time wasted during manual collection of attendance and an opportunity for the educational administrators to capture live and face-to-face classroom statistics for allocation of appropriate attendance scores and for further managerial decisions. The information from RFID database handling system will be used for attendance and for SMS alerts in future prospects. Keeping in mind the significance of event recorders in today's world, we arrived at a common decision of making Attendance Management System using RFID.

CONTENTS

CHAPTER 1 – BRIEFING **08**

1.1 Introduction
1.2 Objective

CHAPTER 2 - PROJECT REQUIREMENTS **10**

2.1 Instruments
2.2 Hardware Components

CHAPTER 3 – RFID TAGS AND READER **11**

3.1 Description
3.2 Types

CHAPTER 4 – SD CARD MODULE **13**

4.1 Description
4.2 Card Formats

CHAPTER 5 – RTC MODULE **15**

5.1 Description
5.2 Specifications
5.3 Schematic

CHAPTER 6 – DOT MATRIX **17**

6.1 Description
6.2 Schematic
6.3 Dot Matrix Datasheet
6.4 Construction
6.5 Working
6.6 Applications

CHAPTER 7 - BUZZER **22**

7.1 Description
7.2 Types
7.3 Applications

CHAPTER 8 - NODEMCU **25**

8.1 Description
8.2 Versions
8.3 Pin Definition

CHAPTER 8 - PLANNING **28**

8.1 Project Planning
8.2 Gantt Chart
8.3 Schematic

CHAPTER 9 - WORKING & ALRGORITHM **31**

9.1 How It Works?
9.2 Algorithmic Decision

CHAPTER 10 - RESULT **33**

10.1 Result
10.2 Conclusion
10.3 Future Aspects

CHAPTER 11 - REFERENCES **36**

LIST OF FIGURE

- **FIGURE 1:** RFID tags and cards
- **FIGURE 2:** RFID reader
- **FIGURE 3:** SD Card module
- **FIGURE 4:** RTC module
- **FIGURE 5:** Dot Matrix Display
- **FIGURE 6:** Buzzer
- **FIGURE 7:** NodeMCU Development kit
- **FIGURE 8:** ESP8266 Versions
- **FIGURE 9:** Gantt Chart
- **FIGURE 10:** Circuit Schematic Diagram
- **FIGURE 11:** Algorithmic Decision

CHAPTER-1

1. INTRODUCTION

The emergence of electronic paradigm for learning compared to traditional method and availability of almost all information on the information superhighway(Internet), nowadays have caused students to be less motivated to come to the lecture rooms than ever before. Laziness on the part of students, nonchalance to school work, extra social activities that have no importance in aiding the objectives of the institution and a lot more, may prevent students from attending lectures. Sequel to these, lecturers and administrators in most developing countries have had to come up with ways to ensure a healthy participation from students, and make sure that the student-lecturer interactive relationship is kept intact. This in some cases have come in forms like roll calls, formats like surprise quizzes, etc. These strategies are however time consuming, stressful and laborious because the valuable lecture time that could otherwise been used for lectures is dedicated to student attendance taking and sometimes not accurate. There arises a need for a more efficient and effective method of solving this problem. A technology that can solve this problem and even do more is the RFID technology.

In this project, we are going to build a time attendance system based on RFID tech with MFRC522 RFID Reader, NodeMCU, Arduino, and several other components described in later sections of the report. When you swipe an RFID tag next to the RFID reader, it sends the data to a web page and save them onto a database. It also shows if you are late or in time accordingly to a pre-set hour and minute. We can check the data on webserver, in database and also on Mobile app designed for the purpose.

2. OBJECTIVE

For the proposed work the objective behind this innovative work is:-

- To record the attendance of students using RFID tags.

- Display the current time and date on the Dot Matrix display along with an option for menu button.

- Sending the arrival and leaving time details of a user to a web page using NodeMCU and save them onto a database and SD card using SD card module with arduino.

- Calculate & store the total working hours of each user and provide options in the menu for retrieving it.

- Provide an option to view, manipulate, clear - data from database and Mobile app, which can be accessed only by the admin using his login through PC.

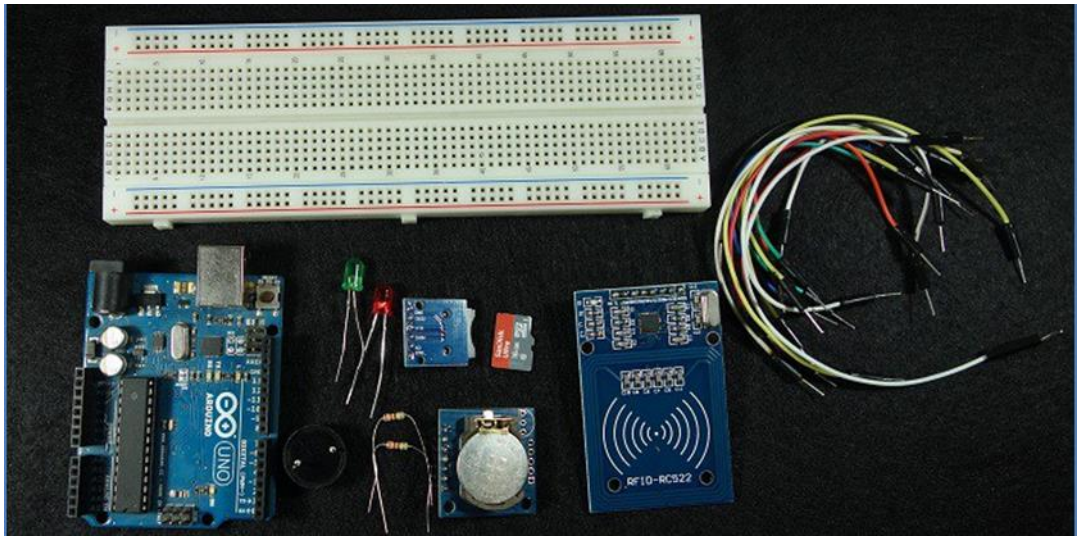
- To reduce human efforts in monitoring the attendance of the students by employing a user friendly web page, mobile app, and automated way of attendance entry.

CHAPTER-2

PROJECT REQUIREMENTS

1. INSTRUMENTS

1. Jumper Wires
2. Power Supply
3. Breadboard
4. 2x 220 Ohm resistor
5. 2x LEDs (1x red + 1x green)
6. Arduino UNO
7. Micro SD card



2. HARDWARE COMPONENTS

1. MFRC522 RFID reader + tags
2. SD card module
3. SD1307 RTC module
4. 8x8 Dot Matrix (With MAX7219 Module)
5. Buzzer
6. NodeMCU

CHAPTER-3

RFID TAGS AND READER

1. DESCRIPTION

In this project we're using the MFRC522 RFID reader.
RFID means radio-frequency identification. RFID uses electromagnetic fields to transfer data over short distances and it's useful to identify people, to make transactions, etc. RFID is an automated identification and data collection technology, that ensures more accurate and timely data entry.

RFID combines radio frequency and microchip technologies to create a smart system that can be used to identify, monitor, secure and do object inventory. At their simplest, RFID systems use tiny chips called - tags that contain and transmit some piece of identifying information to an RFID reader, a device that in turn can interface with computers.

An RFID system needs tags and a reader:

Tags are attached to the object to be identified, in this example we have a keychain and an electromagnetic card. Some stores also use RFID tags in their products' labels to identify them. Each tag has its own unique identification (UID).

Tags and Cards

2. TYPES

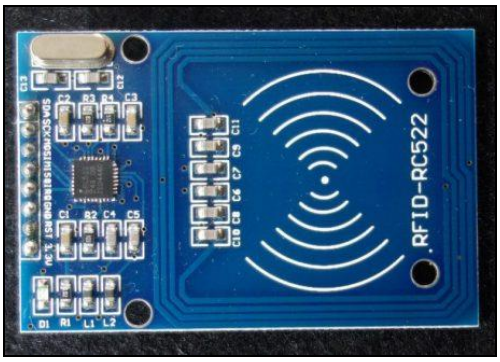
1. Active

Active RFID tags have a transmitter and their own power source, typically a battery. The power source is used to run the microchip's circuitry and to broadcast a signal to a reader for example - the way a cell phone transmits signals to a base station.

2. Passive

Passive tags have no battery. Instead, they draw power from the reader, which sends out electromagnetic waves that induce a current in the tag's antenna.

Reader is a two-way radio transmitter-receiver that sends a signal to the tag and reads its response.



Reader

The MFRC522 RFID reader works at 3.3V and it can use SPI or I2C communication. The library we're going to use to control the RFID reader only supports SPI, so that's the communication protocol we're going to use

CHAPTER-4

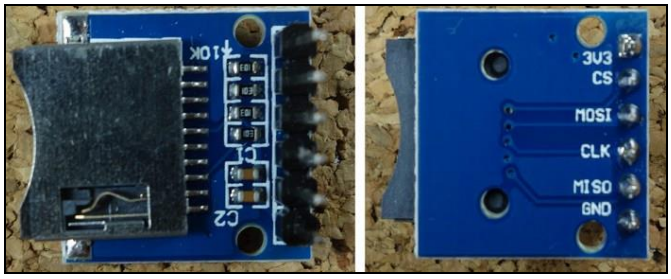
SD CARD MODULE

1. DESCRIPTION

When a tag is read, its UID and time are saved on an SD card so that we can keep track of check in. There are different ways to use an SD card with the Arduino. In this project we're using the SD card module shown in figure below – it works with micro SD card.

This module has SPI interface which is compatible with any SD card and it use 5V or 3.3V power supply which is compatible with Arduino UNO/Mega.

SD module has various applications such as data logger, audio, video, graphics. This module will greatly expand the capability an Arduino can do with their poor limited memory.



SD card module

SD stands for Secure Digital. A Secure Digital (SD) card is a tiny flash memory card designed for high-capacity memory and various portable devices, such as car navigation systems, cellular phones, e-books, PDAs, smartphones, digital cameras, music players, digital video camcorders and personal computers.

2. CARD FORMATS

1. SD (SDSC)

The second-generation Secure Digital (SDSC or Secure Digital Standard Capacity) card was developed to improve on the Multimedia Card (MMC) standard, which continued to evolve, but in a different direction. While MMC uses a single pin for data transfers, the SD card added a four-wire bus mode for higher data rates. The SD card added Content Protection for Recordable Media (CPRM) security circuitry for DRM.

2. SDHC

The Secure Digital High Capacity (SDHC) format, announced in January 2006 and defined in version 2.0 of the SD specification, supports cards with capacities up to 32 GB. The SDHC trademark is licensed to ensure compatibility.

SDHC cards are physically and electrically identical to standard-capacity SD cards (SDSC). The major compatibility issues between SDHC and SDSC cards are the redefinition of the Card-Specific Data (CSD) register and the fact that SDHC cards are shipped preformatted with the FAT32 file system.

3. SDXC

The Secure Digital extended Capacity (SDXC) format, announced in January 2009 and defined in version 3.01 of the SD specification, supports cards up to 2 TB (2048 GB), compared to a limit of 32 GB for SDHC cards in the SD 2.0 specification. SDXC adopts Microsoft's exFAT file system as a mandatory feature.

CHAPTER-5

RTC MODULE

1. DESCRIPTION

To keep track of time, we're using the SD1307 RTC module. However, this project works just fine with the DS3231, which is very similar. One main difference between them is the accuracy. The DS3231 is much more accurate than the DS1307. The figure below shows the SD1307 model.

The DS1307 serial real-time clock (RTC) is a low-power, full binary-coded decimal (BCD) clock/calendar plus 56 bytes of NV SRAM. Address and data are transferred serially through an I²C, bidirectional bus. The clock/calendar provides seconds, minutes, hours, day, date, month, and year information. The end of the month date is automatically adjusted for months with fewer than 31 days, including corrections for leap year. The clock operates in either the 24-hour or 12-hour format with AM/PM indicator. The DS1307 has a built-in power-sense circuit that detects power failures and automatically switches to the backup supply. Timekeeping operation continues while the part operates from the backup supply.

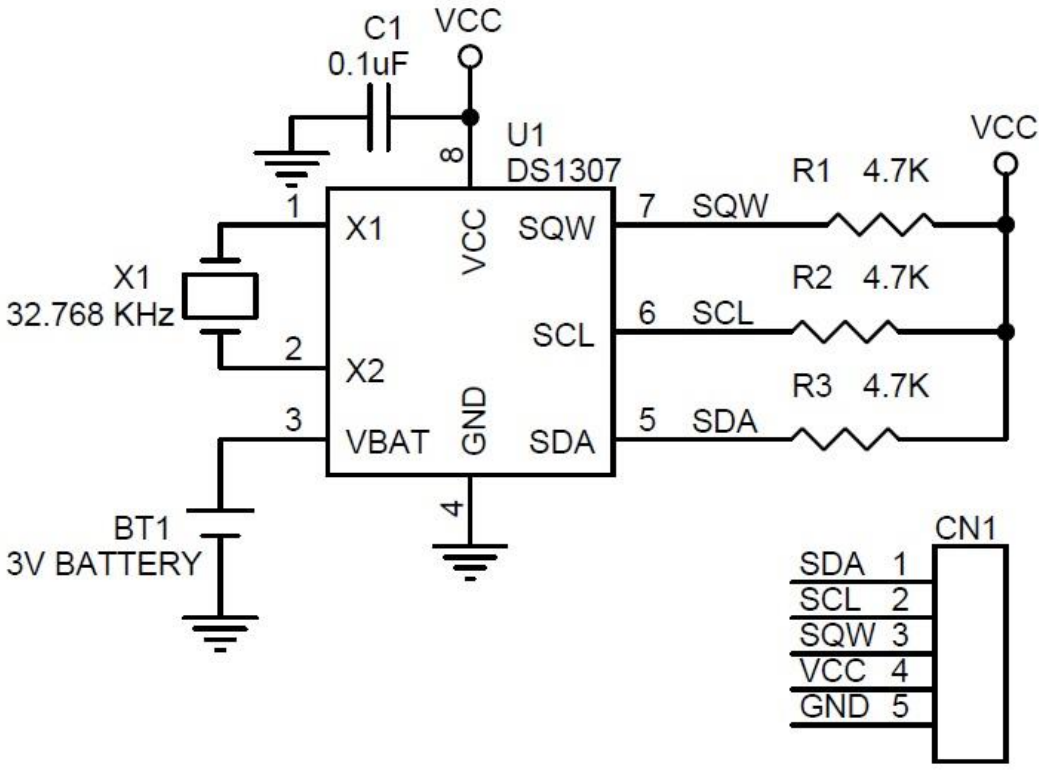
RTC module

We used the RTCLib.h library to read the time from the RTC.

2. SPECIFICATIONS

- Supply 5V DC
- Completely Manages All Timekeeping Functions
- Real-Time Clock Counts Seconds, Minutes, Hours, Date of the Month, Month, Day of the Week, and Year with Leap-Year Compensation Valid Up to 2100
- 56-Byte, Battery-Backed, General-Purpose RAM with Unlimited Writes
- Programmable Square-Wave Output Signal
- Simple Serial Port Interfaces to Most Microcontrollers
- I2C Serial Interface
- Low Power Operation Extends Battery Backup Run Time
- Consumes Less than 500nA in Battery-Backup Mode with Oscillator Running
- Automatic Power-Fail Detect and Switch Circuitry

3. SCHEMATIC

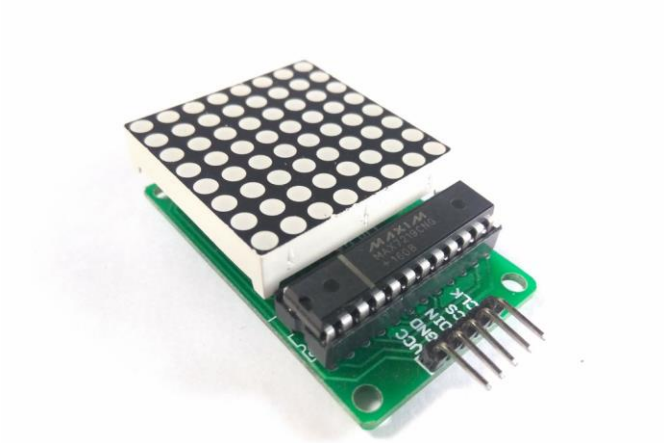


CHAPTER-6

DOT MATRIX DISPLAY

1. DESCRIPTION

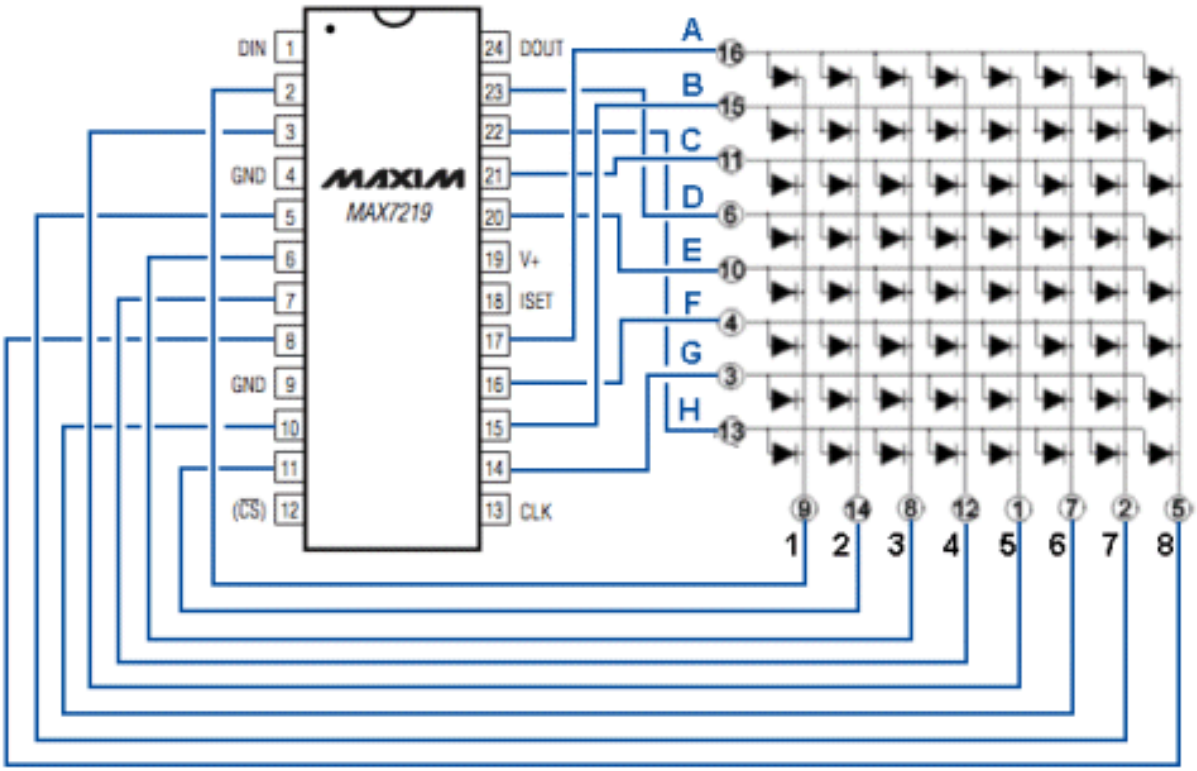
A dot-matrix display is an electronic digital display device that displays information on machines, clocks and watches, public transport departure indicators and many other devices requiring a simple display device of limited resolution.



DOT MATRIX Display

It is commonly used to display time, temperature, news updates and many more on digital billboards. Dot Matrix Display is manufactured in various dimensions like 5x7, 8x8, 128x16, 128x32 and 128x64 where the numbers represent LEDs in rows and columns, respectively.
Arrangement of the LEDs in the matrix pattern is made in either of the two ways: row anode-column cathode or row cathode-column anode. In row anode-column cathode pattern, the entire row is anode while all columns serve as cathode and vice-versa pattern is there in row cathode-column anode. LED wafers are glued to the bottom of the segments and glow when powered ON. The interesting part is that 35 LEDs are controlled by using a combination of 14 pins. Conductor tracks are laid all over the board to power each LED.

2. SCHEMATIC



8x8 DISPLAY WITH MAX7219 CHIP

3. MAX7219 DATASHEET

Pin No.	Symbol	Description
1	DIN	Serial Data Input Pin
2,3,5~8,10,11	DIG0 – DIG7	Common ground for all eight segments
4, 9	GND	Ground
12	LOAD(CS)	Chip Select or Data shift pin
13	CLK	Clock Pin
14~17,20~23	SEG A – SEG G, SEG DP	SEGEMENT of all DIGITS
18	ISET	Current output adjust pin
19	V+	Power supply
24	DOUT	Pin used to Connect Second chip serially

3. CONSTRUCTION

The construction of dot-matrix display is very simple. If one want to make their own prototype display then the diodes are just solder on Vero board or premade double or single sided board. Suppose we want a construct a prototype 8*8 dot matrix display shown in figure description, then we require 64 light emitting diodes. These diodes are solder on overboard or single sided board. The positive end of one diode is connected to other positive end of the diode for making the rows, similarly the 8 rows are made by connecting the positive end of each diode. The negative end one diode is connected to the negative end of other diode. For making the columns of this display, similarly the 8 columns are made by connecting the negative end of each diode. All these diodes are connected with each other through bare copper wire and all these are should be properly sold otherwise there would be no connection between all these.

These dots are shaped like a funnel and are known as LED segments. LED wafer is fixed at the bottom of the LED segment. When the LED wafer is powered, it emits light. The light passes through the funnel shaped segment which acts as a diffuser and glows the dot. All the LED segments are fitted on a frame with the help of plastic molding. It is the tough plastic molding that keeps dot matrix display unaffected from dust, moisture etc. and hence acts as a protective sheath.

4. WORKING

The dot-matrix chip is used similar to any shift register. First serial data is sent to chip bit by bit. Once all data is sent chip shifts this serial data to output by enabling CS pin. The step by step procedure of working goes as below.

- First connect DIN, CS and CLK pin. These three pins are important to controlling chip.
- Next is selecting resistor for ISET pin. As we know that there is no standard parameter for segment displays in market. They have different voltage and current setting.

Forward voltage					
ISeg	1.5V	2.0V	2.5V	3.0V	3.5V
30mA	17.8kΩ	17.1kΩ	15.8kΩ	15.0kΩ	14.0kΩ
20mA	29.8kΩ	28.0kΩ	25.9kΩ	24.5kΩ	22.6kΩ
10mA	66.7kΩ	63.7kΩ	59.3kΩ	55.4kΩ	51.2kΩ

- There are two ways to use this chip. One is to follow the instructions given in datasheet to send the data bit by bit. Second way is to use libraries previously written for this chip. Using the libraries is easiest way to get the required result. With libraries you can just enter the required data to send without worrying anything.
- We will send data to the chip through DIN pin. The data is sent BIT by BIT by setting the clock of chip for each bit. The Chip stores the serial data its registers until all data is received. After completing data sending we will set the CS pin for the chip to shift all data stored in its register to the output.
- Once the data is put out by the chip it will light up the corresponding LEDs to display the result.

5. APPLICATIONS

1. Television Sets

The dot matrix display is used in home television sets for displaying the television viewing picture, channel view and loud speaker view.

2. Computer Monitors

In computer monitors the dot matrix display is used for displaying the data, picture and everything which is sending by the CPU.

3. Head Monitor Display

The dot matrix display is used in head monitor display devices which are used in military, Government (fire, police etc.) civilian and commercial purposes.

4. Broadcast Reference Monitors

It is used in broadcast reference monitor which are basically the video monitor that displays the different videos.

5. Medical Monitors

It is used in that medical equipment which have the displaying facility for observing the disease conditions.

CHAPTER-7

BUZZER

1. DESCRIPTION

A buzzer or beeper is an audio signaling device, which may be mechanical, electromechanical, or piezoelectric (piezo for short).
Typical uses of buzzers and beepers include alarm devices, timers, and confirmation of user input such as a mouse click or keystroke.

We used the buzzer in our project as an indicator to whether the tag was scanned and entry of student, employee get marked into the database or not. Buzzer which will have long life, will also make the entering applicant satisfied by making a buzzing or beeping sound indicating that the his/her attendance has been marked. Also it is less costly as compared to liquid crystal display, thereby reducing the overall cost of our project.

Early devices were based on an electromechanical system identical to an electric bell without the metal gong. Similarly, a relay may be connected to interrupt its own actuating current, causing the contacts to buzz. Often these units were anchored to a wall or ceiling to use it as a sounding board. The word "buzzer" comes from the rasping noise that electromechanical buzzers made.

2. TYPES

1. Electromechanical

Early devices were based on an electromechanical system identical to an electric bell without the metal gong. Similarly, a relay may be connected to interrupt its own actuating current, causing the contacts to buzz. Often these units were anchored to a wall or ceiling to use it as a sounding board. The word "buzzer" comes from the rasping noise that electromechanical buzzers made.

2. Mechanical

A joy buzzer is an example of a purely mechanical buzzer and they require drivers. Other examples of them are doorbells

3. Piezoelectric

A piezoelectric element may be driven by an oscillating electronic circuit or other audio signal source, driven with a piezoelectric audio amplifier. Sounds commonly used to indicate that a button has been pressed are a click, a ring or a beep. A piezoelectric buzzer/beeper also depends on acoustic cavity resonance or Helmholtz resonance to produce an audible beep.

3. APPLICATIONS

While technological advancements have caused buzzers to be impractical and undesirable, there are still instances in which buzzers and similar circuits may be used. Present day applications include:

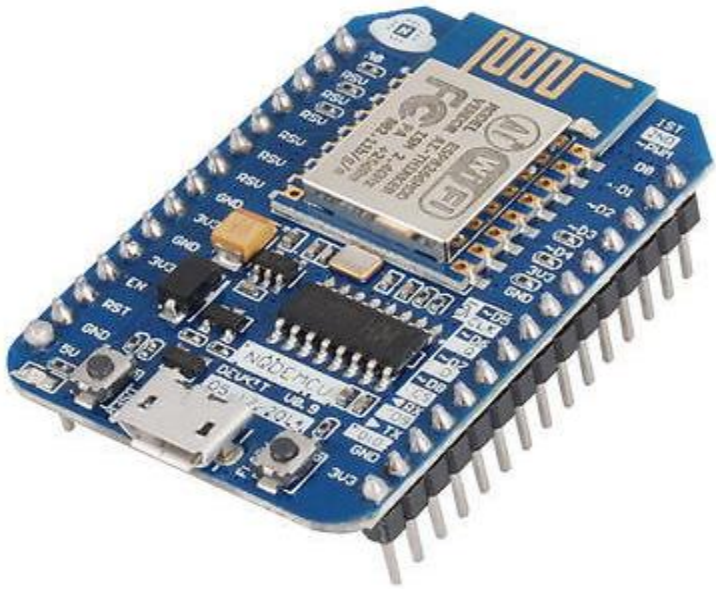
(i) Novelty uses
(ii) Judging panels
(iii) Educational purposes
(iv) Annunciator panels
(v) Electronic metronomes
(vi) Game show lock-out device
(vii) Microwave ovens and other household appliances
(viii) For games (basketball, volleyball etc.)

CHAPTER-8

NODEMCU

1. DESCRIPTION

NodeMCU is an open source IoT platform. It is an open source LUA based firmware developed for ESP8266 wifi chip. Since NodeMCU is open source platform, their hardware design is open for edit/modify/build.



NodeMCU Development Board/kit v0.9 (Version1)

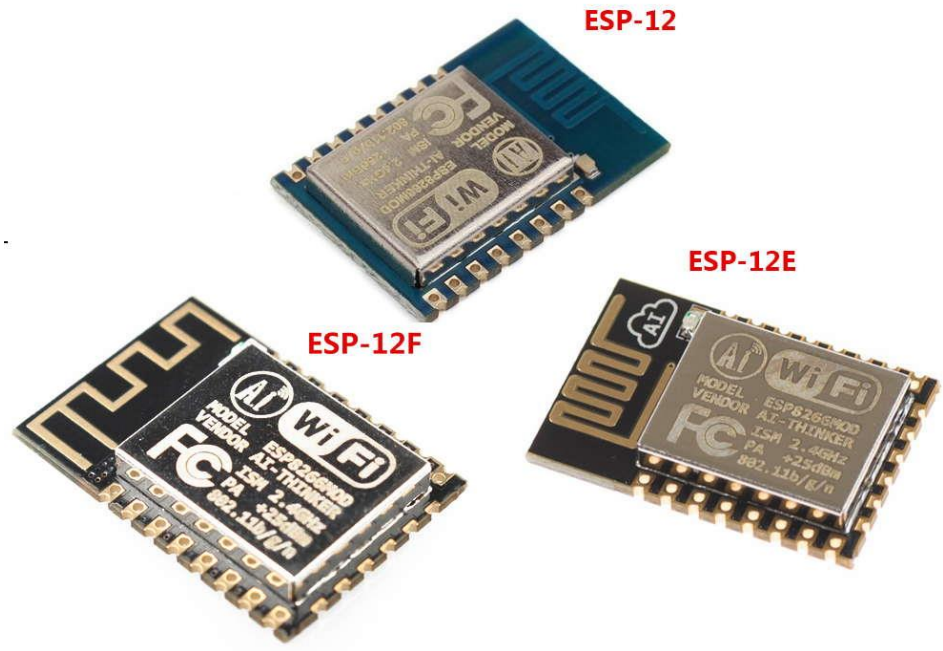
NodeMCU Dev Kit/board consist of ESP8266 wifi enabled chip. The ESP8266 is a low-cost Wi-Fi chip developed by Espressif Systems with TCP/IP protocol. NodeMCU Dev Kit has Arduino like Analog (i.e. A0) and Digital (D0-D8) pins on its board.

It supports serial communication protocols i.e. UART, SPI, I2C etc. Using such serial protocols we can connect it with serial devices like I2C enabled LCD display, Magnetometer HMC5883, MPU-6050 Gyro meter + Accelerometer, RTC chips, GPS modules, touch screen displays, SD cards etc.

2. VERSIONS

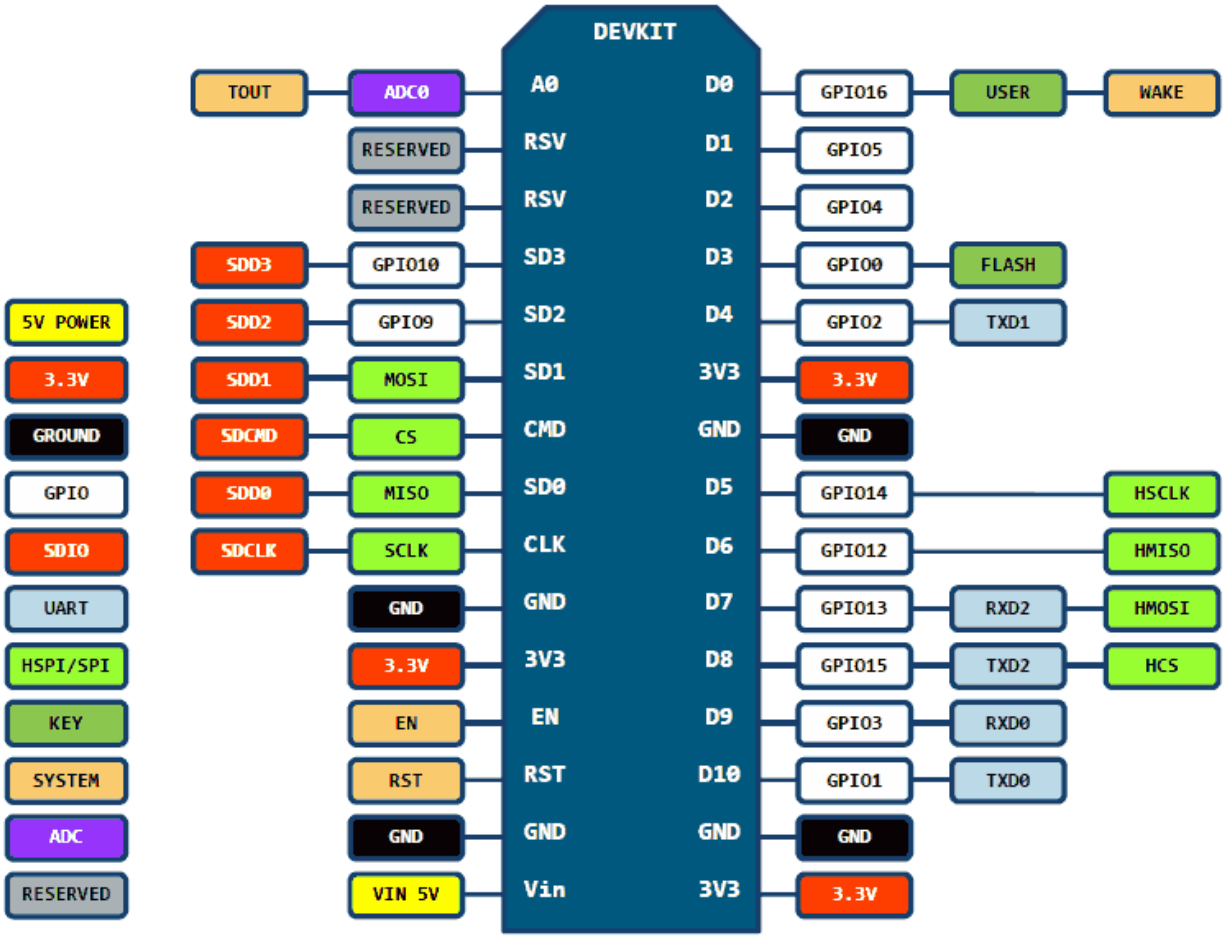
NodeMCU comes in two versions v0.9(Version 1) and v1.0(Version 2).

- In 1st version of NodeMCU Dev Kit v0.9, CH341SER USB to Serial converter is used whereas in 2nd version of NodeMCU Dev Kit v1.0, CP2102 USB to Serial converter is used.
- 1st version uses ESP-12 and 2nd version uses ESP-12E (Enhanced version).
- Extra 6 pins (MTDO, MTDI, SD_3, MTMS, MTCK, SD_2) brought out on ESP-12E version of ESP-12 modules as shown in below figure. Though Quad SPI pins are brought out, they are internally used for flash memory access.
- Also, there is slight antenna design difference in ESP-12 versions like ESP12-E & ESP-12F as shown in below figure.



ESP8266 Versions

3. PIN DEFINITION



D0(GPIO16) can only be used as gpio read/write, no interrupt supported, no pwm/i2c/ow supported.

CHAPTER-9

PLANNING

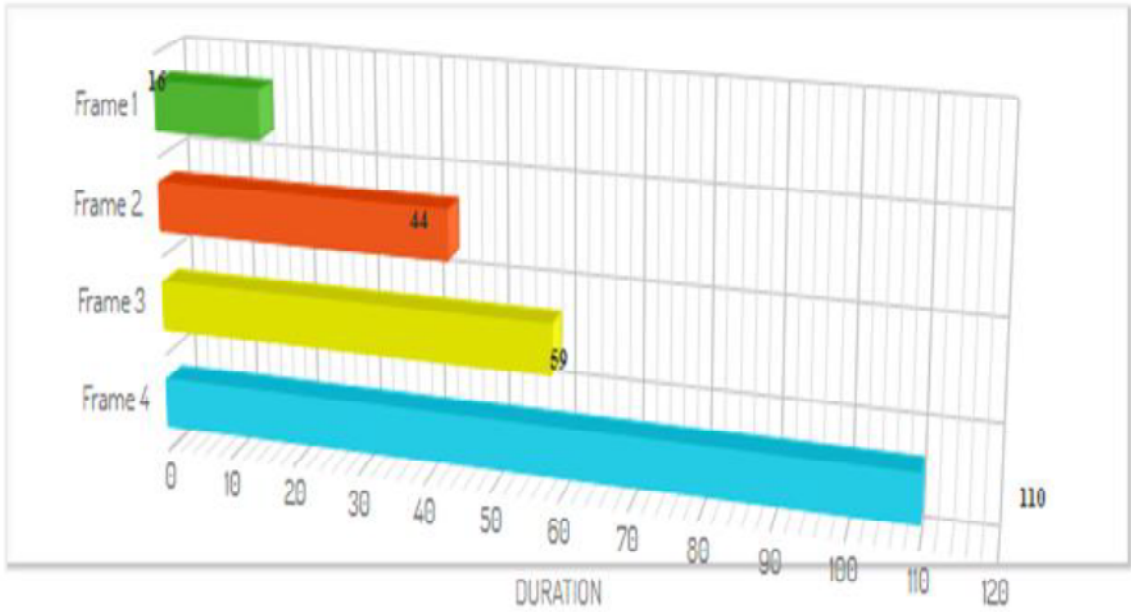
1. PROJECT PLANNING

ACTIVITIES

1. Documentation + Component Purchasing
2. Hardware design + Break for Exams + Testing of different sections
3. Hardware + Software co-design
4. Project Report + Final Testing + Submission

Frame	Time
Frame 1 (14-Feb-2019)	1 Week (Synopsis submission)
Frame 2 (12-Mar-2019)	3 Weeks (50% Project completion)
Frame 3 (4-Apr-2019)	3 Weeks (100% Project completion)
Frame 4 (11-Apr-2019)	1 Week (Final Submission)

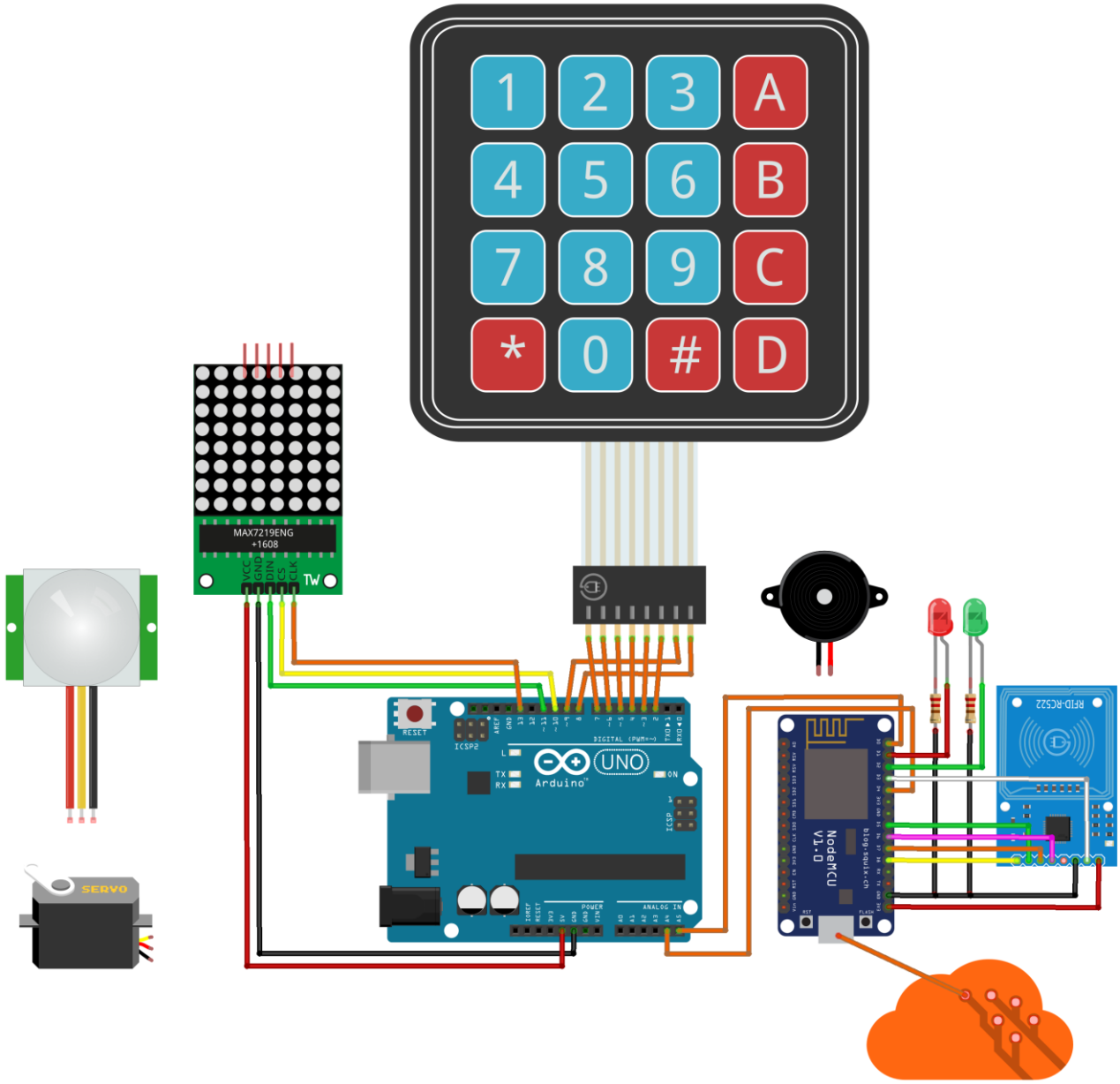
2. GANTT CHART



Frames are showing the activities associated with them respectively.
Frame 1 is showing the first duration.
Frame 2 is showing the total duration up to frame 2 set of activities.
Frame 3 is showing the total duration up to frame 3 set of activities.
Frame 4 is showing the total duration up to final submission.

3. SCHEMATIC

The circuit for this project is shown in the circuit schematics below:-



Circuit schematic diagram

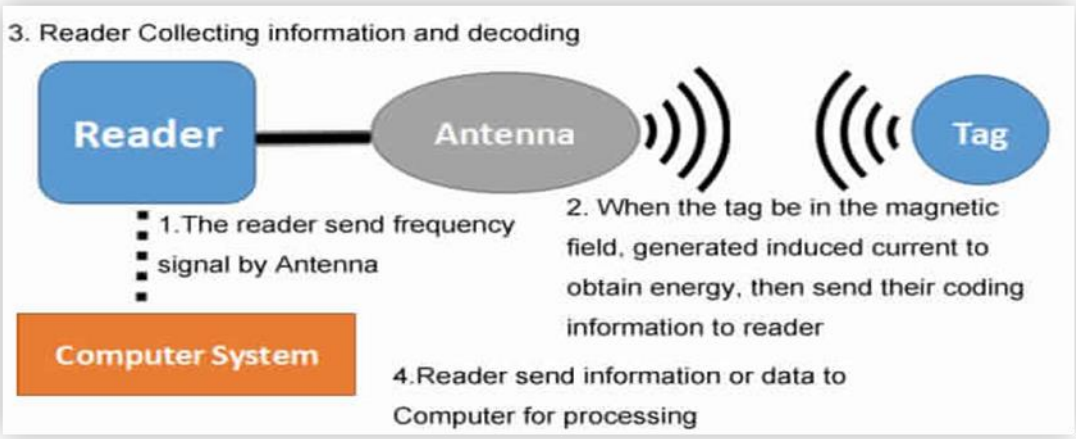
CHAPTER-10

WORKING AND ALGORITHM

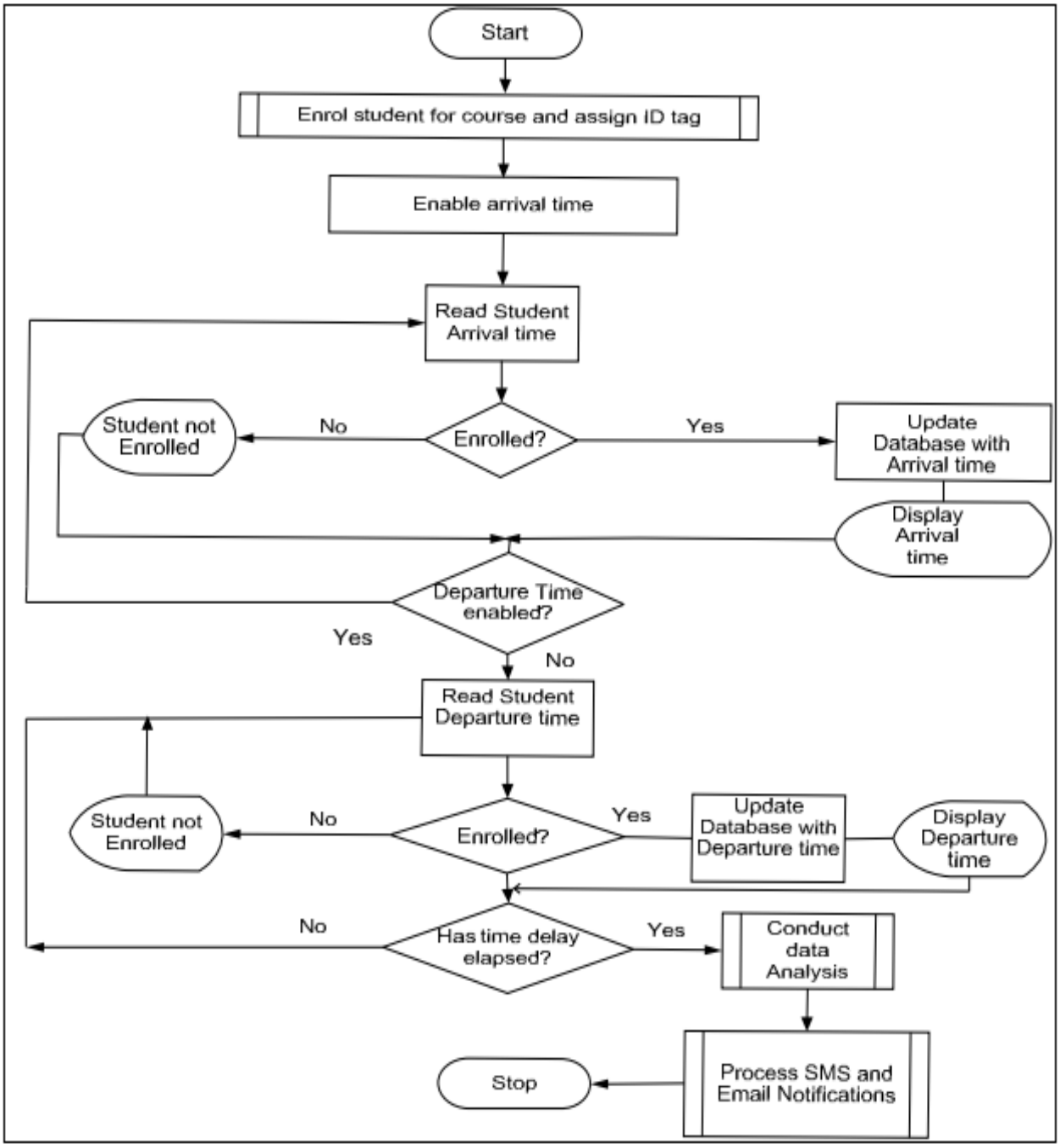
1. HOW IT WORKS?

We have RFID reader installed at some distance far from tags. It can be installed on the front door of classrooms, or any other door facilitating the attendance system for the respective means. By placing the tag on the reader at a small distance and the reader will scan the UID number with reference time for the first member entries and between each subsequent entries and the final entry.

- RFID tag is detected by the reader module when in the range of 10 cm.
- This card receives signal from reader and gives a return signal with ID number.
- After reading the card it checks the database and decides whether card is duplicate or not.
- According to database the controller increases the count for that specific lecture, send it to the web page, mobile app, and stores it on the database.



2. ALGORITHMIC DECISION



Flowchart showing the mode of operation of the student attendance RFID system

CHAPTER-11

1. RESULT

On completion of concept of having an RFID based attendance system using the NodeMCU and Arduino UNO, it can been proclaimed that the idea is much innovative as well as very much feasible and cost effective also to make as well as to maintain it absolutely.

The concept behind this work is to maintain the attendance of students, employees as well as safety of records from manipulation. It also save time for both teachers, lecturers as well as people and reduces errors.

The Arduino microcontroller used here is very important not only in this project but has also variety and wide range of aspects and uses. Without microcontroller electronics is nothing just a box. Whereas in the demo project we can clearly conclude that the attendance can be marked without any delays, errors maintaining people record safety and making students, employees to be punctual thereby reducing laziness and manipulation in the systems.

The working demo of the projects is very charming feasible and realistic and there would be no problem in implementing this project as a physical work.

2. CONCLUSION

Thus by making this project we can easily conclude that RFID technology evolves, more sophisticated applications will use the capability of RFID to receive, store and forward data to a remote sink source. The versatility of RFID can be used in implementing functional and automatic student course attendance recording system that allows students to simply fill their attendance just by swiping or moving their ID cards over the RFID reader which are located at the entrance of lecture halls with a considerable degree of success and acceptability of usage in our faculty. Such an RFID based attendance system can shift the paradigm of student‘s lecture attendance monitoring in classroom and provide a new, accurate, and less cumbersome way of taking student attendance in school.

- 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.
- Lecturers need no more wasting time, and effort to have their attendance register.
- Attendance register can easily be uploaded/updated to the database.
- The web page and mobile app services provide tremendous support and makes it very much easier to view attendance records and manipulate them, if needed.

Helping in maintain records in a clean, efficient and user – friendly manner, it can be clearly seen as a futuristic project and as the demo also replicates the realistic project we can see how easy and maintenance free cost is this project. Just a onetime investment.

3. FUTURE ASPECTS

A student attendance and information system are designed and implemented to manage student's data and provide capabilities for tracking student attendance, grading student marks, giving information about timetable, lecture time, room number, and other student-related information. Also, the proposed system provides easiness for the staff where there is no need for extra paper works and additional lockers for saving data. Results achieved the innovation of developing the system proved reliable to support the attendance management system for an academic sector in the usage of the RFID and wireless technology through nodemcu and microcontroller board. It can be considered as a successful implementation.

Two primary goals for future directions, the first goal is to extend the proposed system to include staff information with their salary structure and other data as well. The second one is to extend the system to encompass more than one faculty with the insertion of face detection mechanism in the attendance monitoring system to control card replacements among different students.

REFERENCES

[1] Yuru, Z., Delong, C., & Liping, T. (2013). The Research and Application of College Student Attendance System based on RFID Technology. International Journal of Control and Automation, 6(2), 273-282

[2] Kohalli, S. C., Kulkarni, R., Salimath, M., Hegde, M., & Hongal, R. (2016). Smart Wireless Attendance System. International Journal of Computer Sciences and Engineering, 4(10), pp. 131-137.

[3] Olanipekun, A. A., and O. K. Boyinbode. "A RFID Based Automatic Attendance System in Educational
Institutions of Nigeria." International Journal of Smart Home 9.12 (2015): 65-74.

[4] Arulogun, O. T., et al. "RFID-based students attendance management system." International Journal of Scientific & Engineering Research 4.2 (2013): 1-9.