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Department of Electronics

**Project Report**

**On**

***“RFID Door Lock”***

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## Acknowledgement

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The Success behind any project always involves many people. The same thing is with us, in fact may be I even forgot many of the names.

But the first personality that comes to my mind is **“Miss.Sunita Adavimath”**

Who is HOD of our Electronics Department. She has helped me in all the way that she can. My sincerer thank for her help & encouragement.

I Would also thank our teacher **“Miss.Nimisha Rai”** , for help & inspiration guidance.

**ONCE AGAIN TO ALL OF THEM SINCERELY.**

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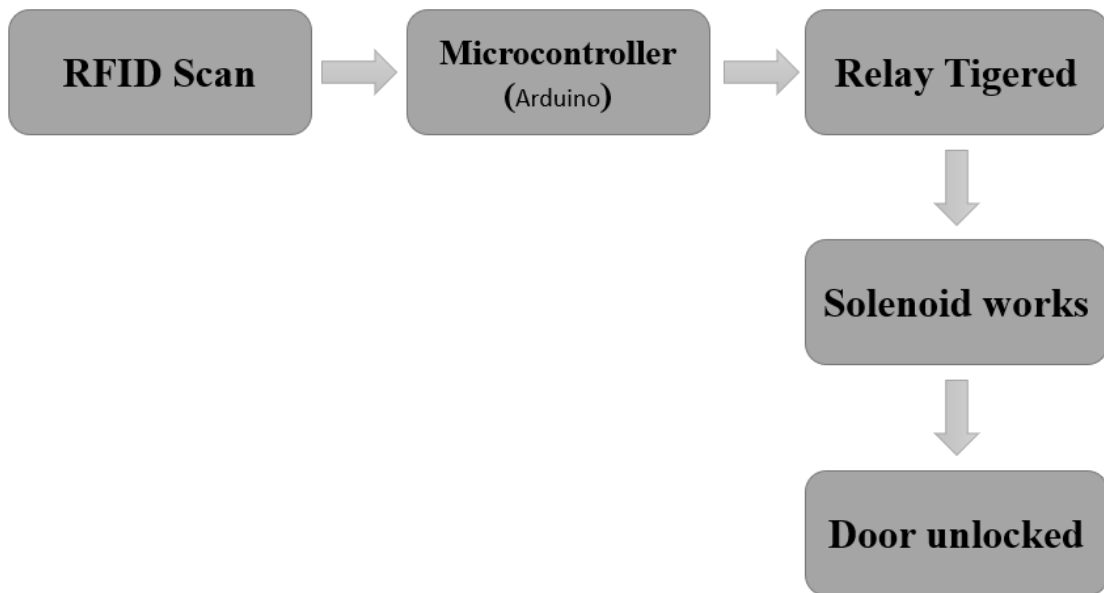
## Abstract

This is an IoT-enabled RFID-based door locking gadget. This door lock system will know how long the door is open and in this door lock system, only those people who register will be able to enter using their card or tag. It uses a 12v solenoid door lock that operates with the help of 5v relay and Arduino. The Arduino board runs with complete programming that is stored inside it. By using this gadget, an owner can track his office and the place where he wants to let the specific people in. It is also very secure. RFID Module have been used in this door lock system. The buzzer will buzz if your card is wrong

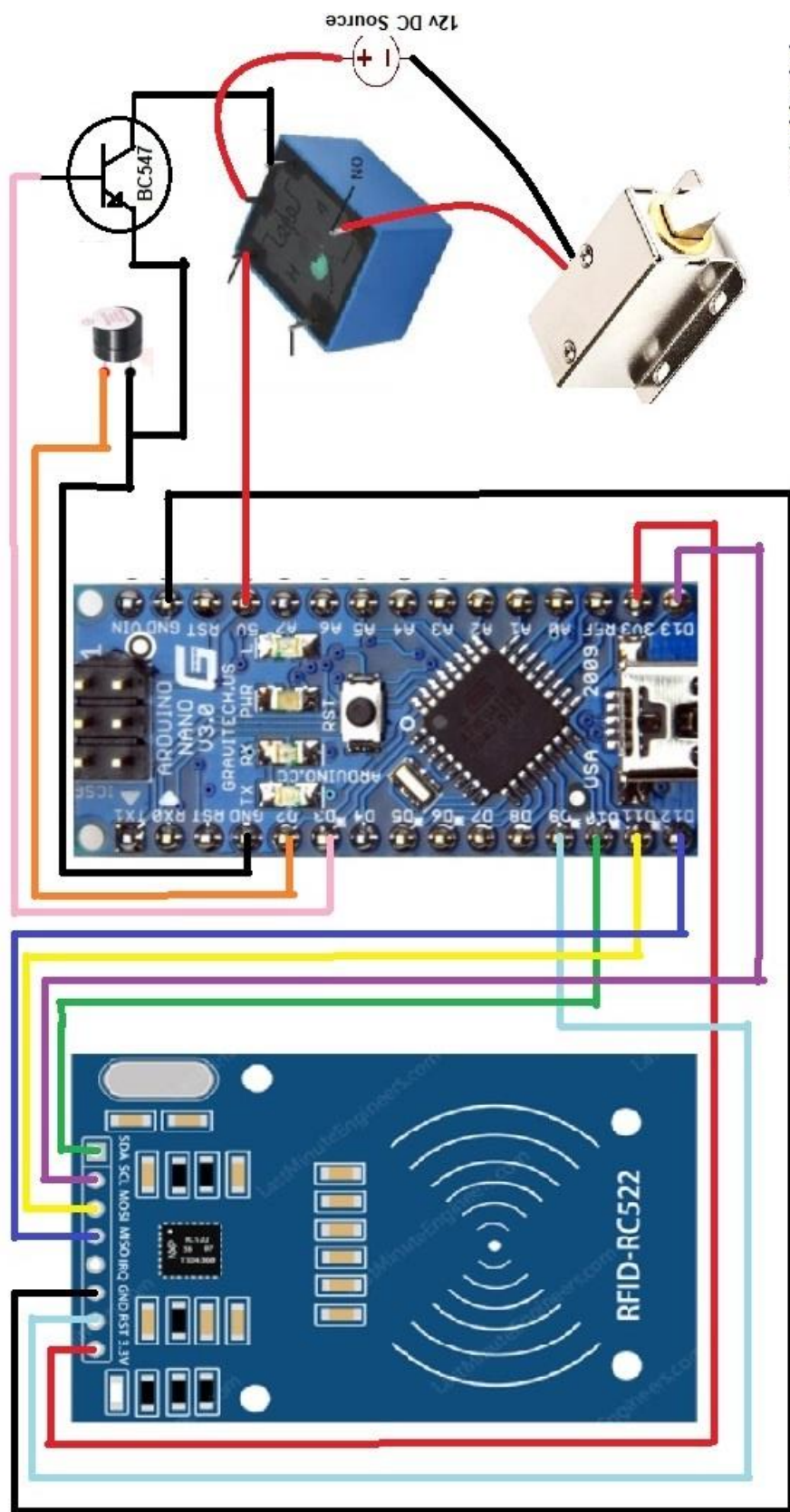
## Introduction

This gadget is designed with the help of an Arduino using a 12v solenoid lock that pushes the latch forward and back. When we scan our register card, there is a loop start of store programming in which the relay is triggered, then the relay completes the 12v circuit and the electromagnetic field is induced and mechanism in it works, which locks and opens the lock. In simple language, when a card is scanned, the condition given in the programming matches, then the command given in that condition becomes active, such that when the correct card is scanned, the open condition will match, in which the relay will be triggered and the buzzer will beep for 500 microseconds and the door lock will be open but when an unregistered card is scanned then the condition of the wrong card will match which will beep twice for 500 microseconds.

# Block Diagram



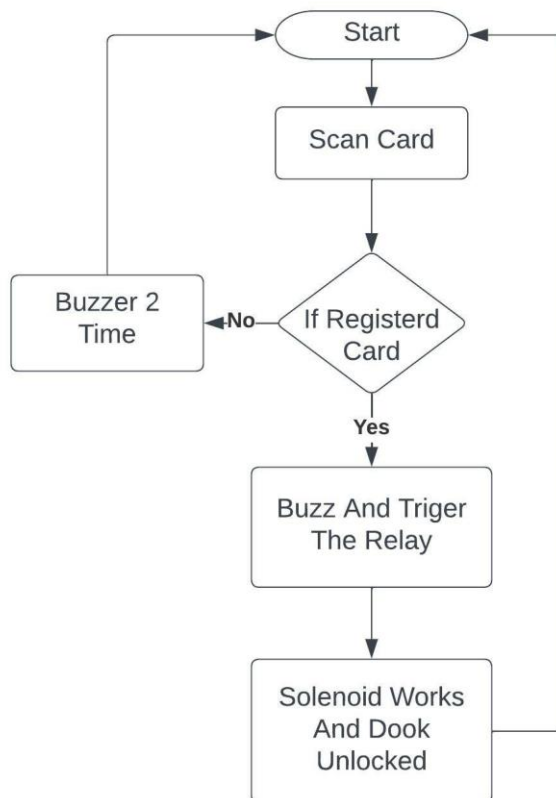
# Circuit Diagram



-santosh kandapl

## Working

Firstly, the door lock system will start, and the scanning process occurs, if the card is registered previously then the command will proceed otherwise the WRONG CARD message appeared by buzzer 2 times in 1 second and again the command scanning process will start, If the card is registered, buzzer beeps 1 time for 500 microseconds and the command will execute into the mechanical door lock via Relay and the door lock will be open. When the door lock is open, the command will run again and the scanning process starts, but now the door lock will be closed. The flow chart of the working method is explained in Figure below. Program is provided at last of the report





# Component list

Sr. no.	Part name	Quantity	Details
1	Arduino nano microcontroller	1	It is a small, complete, and breadboard-friendly board based on the ATmega328P released in 2008
2	RFID Module (MFRC522)	1	This <b>RC522</b> RFID Card Reader Module <b>13.56MHz</b> is a low-cost MFRC522 based RFID Reader Module is easy to use and can be used in a wide range of applications.
3	Buzzer	1	This active <b>buzzer</b> can be used to generate tones and sounds from a <b>5V</b> signal.
4	5v Relay	1	It is an automatic switch that is commonly used in an automatic control circuit and to control a high-current using a low-current signal
5	BC547 (transistor)	1	It is kind of an <b>NPN</b> transistor. The <b>BC547</b> transistor is an NPN transistor. A transistor is nothing but the transfer of resistance which is used for amplifying the current
6	12v Solenoid Lock	1	This DC 12V Cabinet Door Lock Electric Lock Assembly Solenoid can be used for locking sell-machine, storage shelf, file cabinet and etc.
7	Blank PCB Board	1	It is quite simply an empty circuit board free from any of the components that are installed to create a functioning circuit board
8	Jumper Wires	You can't count them, you just need them 😊	Jumper wires are used to connect two points in a circuit

## Result

**I**t is an IoT-based gadget designed for RFID-based door locking systems, developed with the help of Arduino nano. This gadget is being managed by software programming. Let us see how this door lock system works. A 5-volt power adapter is used for the power Arduino and RFID module and 12-volt for Solenoid Lock. If scan any card which is unregistered it shows the wrong card, and the lock is locked. If scanning the registered card, it opens the door lock. And now scan the registered card again, the lock is locked.

## Conclusion

The use of the Arduino nano microcontroller in this project allows design simplicity; therefore, the project can be achieved in a shorter time than other technologies previously. And this door lock system is also very secure and saves the information of people coming and going.

# Advantage & Disadvantage

## Advantages :

- Data on keycards is secure because it takes specialized equipment to read it. This maintains the lock system security.
- Many companies use RFID locks for business efficiency since they track the person carrying the card and record their movements with a smart-card system. Businesses can see where rooms aren't being used on a regular basis and effectively assign the use of certain rooms because of information gathered on these cards.
- RFID cards can be programmed and reprogrammed as the aspects of security requirements change. If an employee leaves, the card can be deactivated or reprogrammed for a new employee. It also allows changes to areas that personnel can access as their permissions grow and change.
- RFID locks allow you to achieve more than a traditional lock could. They allow you to operate home safety features in ways homeowners never could with key locks. It enables them to complete more safety actions with less work.

## Disadvantages :

- Just like traditional keys, you can forget your keycard.
- It is possible the system can be hacked or bypassed by someone who is tech-savvy, so they aren't foolproof.
- One major problem is that electric RFID systems may malfunction during power outages.

# Future Scope

## IT Asset Tracking

- Institutions with large IT assets with numerous data centres.

## E-Passport

- Pioneer: Malaysia(1998)visual data page, travel history
- Norway(2005), Japan, EU, UK, Australia, US, Serbia.

## Transportation Payment

- Gurgaon, Noida : Toll-Gates
- **Fast tag** for Toll in Toll-Road
- Delhi Metro Passes
- Tap and Pay (**Credit card\ Debit card**)

## Zombie RFID tag

- A tag that can be temporarily deactivated when it leaves the store.

## References

- <https://en.wikipedia.org>
- <https://www.google.com>
- <https://create.arduino.cc/projecthub/diyprojects/diy-rfid-door-lock-system-074173>
- <https://www.datasheets.com/>
- <https://lucid.app/> (For flowchart)