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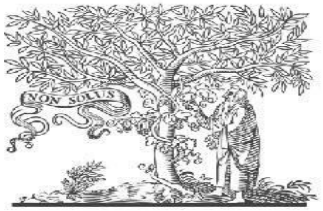

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OTP BASED DOOR LOCK SYSTEM

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Abstract -
In the twenty-first century, security has grown to be a top priority; people now want to feel secure at home, at work, and globally. The project's goal is to improve and advance the safety and security of people's lives and property by developing a smart door security system using Arduino and Bluetooth applications. The initiative mainly focuses on protecting doors and enhancing their security in our homes, workplaces, or public buildings. With the aid of smart doors, the doors are protected primarily to allow access to only authorised people using their cell phones and GSM application usage when inside or while you are away from your home and workplace. The study mostly discusses how to safeguard doors and increase their security.
***Keyword*: OTP, Home Automation.**

I. INTRODUCTION:

Safety future has grown to be a top priority; people now want to feel secure at home, at work, and globally. Home security is a crucial component of daily life. It's a hot topic right now. Everywhere and for everyone, security is of utmost importance. Everyone desires the security of their house, business, banking, etc. This essay describes a home door-controlling security system. This security system is practical and easy to operate.

II. WORKING PRINCIPLE:

The circuit's controlling element is the Arduino microcontroller. It has overall driving unit control. It is frequently employed in communication. The Arduino microcontroller is connected to the GSM module, keypad, buzzer, and LCD screens for power supply. The microcontroller is attached to the figure-print sensor. The Arduino microcontroller serves as the power source for the keyboard, GSM, and buzzer. The circuit will be operated by a motor driver.

The 4-digital password is initially typed into the keypad. Each person needs a different password to unlock the door. When the password correctly entered, the door opens; the LCD shows a success message, and the user receives a notification on his mobile device via the GSM module. The GSM module is utilised for message sending and receiving.

At first, the keypad is used to enter the 4-digit password. To open the door, each person needs a different password. When the password is correctly entered, the door opens, the LCD shows a success message, and the GSM module sends the user a notification message to his mobile device. The transmission and receiving of message takes place through the GSM module.

A fingerprint sensor has been employed for increased security. The fingerprint of the person will be scanned and stored in the databases. When the user enters their fingerprint scanner is accurate. If it is, the door opens; if not, it remains closed until the user who authenticated them kept their thumb print.

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Block Diagram:

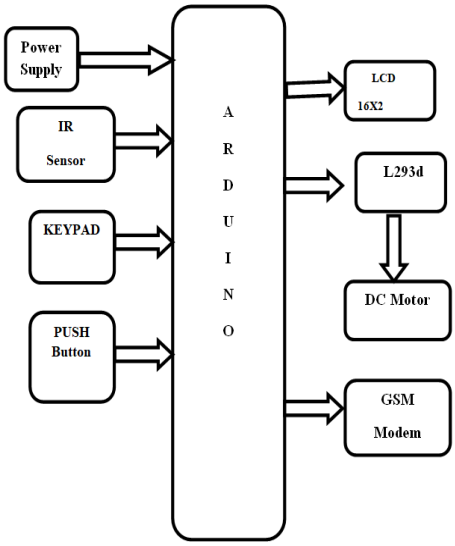

Fig: Block Diagram

Flow chart:

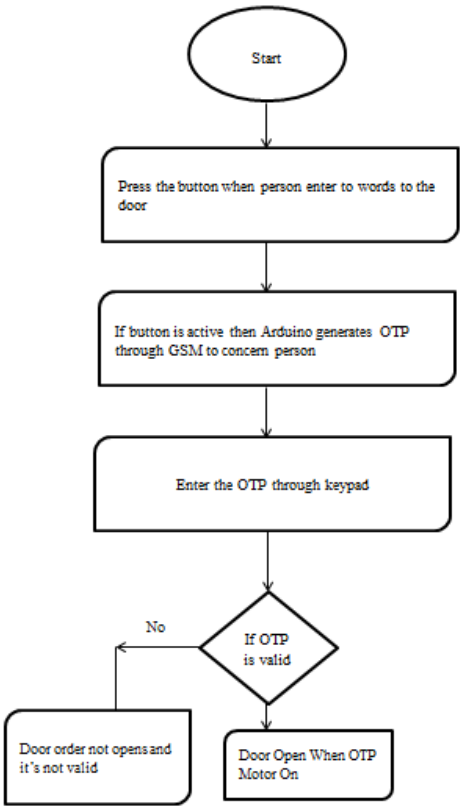

Fig: Flow chart

Components:

Introduction:

As the name implies, a microcontroller is a tiny controller. They resemble single-chip computers, which are frequently incorporated into larger systems as processing or controlling elements. For instance, the control you are using most likely has microcontroller that decode additional regulating mechanisms. Where automation is required, they are also in vehicles, washing machines, microwaves, toys, etc.

Arduino Uno:

It is microcontroller board made by arudino.cc which used for specific application related to communication and can be extended to control another circuited or devices

The board is based on ATmega328p microcontroller and assets of digital analog pins which can be used for both input and output the board is programmed with its own IDE software called Arduino IDE which connects USB cable and the power Supply 7-20 V.

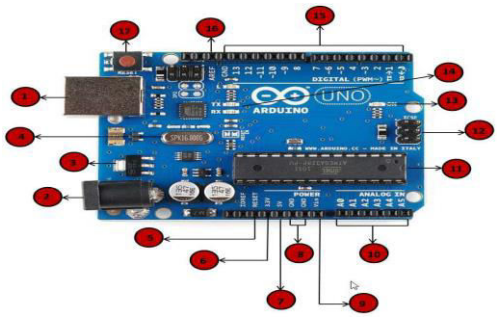

Fig: Arduino Uno

Technical specification:

- IC : ATmega328p
- Clock Speed 16MHz
- Meomory:32kb
- SRAM: 2kb
- EEPROM: 1 Kb
- Digital input/output pins 14.
- Operating voltage 5V
- Power source USB, 5.5 mm jack.

GSM:

A digital, open cellular technology called GSM (Global System for Mobile Communications) is utilised to transmit

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mobile voice and data services. digital mobile phone network is widely used. The most popular of the three digital wireless telephone technologies (TDMA, GSM and CDMA) is GSM, which employs a version of TDMA. Data is converted from, compressed, and sent across a channel with a dedicated time a lot using GSM.

GSM Frequencies:

The Spectrum of radio frequencies is where limited resource which is to be divided among all the network providers around the world Global System for Mobile Communication is a method combing TDMA/FDMA methods to divide band width equally here, the FDMA for divides the frequency of 25 MHz into 124 carrier frequencies each having a band width of 200 KHz.

GSM Modem:

The radio subsystem, the network and switching subsystem, and the operation subsystem make up the GSM architecture. The mobile station and base station subsystems. Make up the radio subsystem. The mobile station, which consists of a transceiver, display, and processor, is typically a mobile phone. Each handheld or mobile device has a distinct identification that is kept in a module called the SIM (Subscriber identification Chip). The database for the mobile station is stored on a little microchip that is placed into the mobile phone.

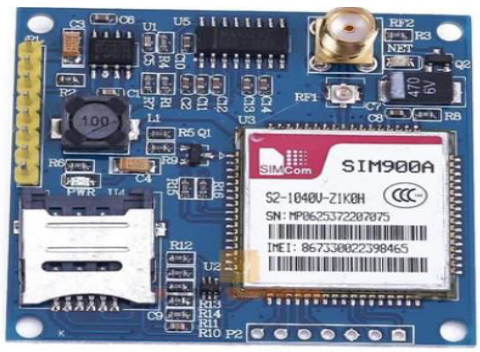

Fig: GSM Modem

LCD:

In embedded systems, liquid crystal displays are crucial hardware components. The user has a lot of flexibility with it because he can display (LCD) is a small, flat electronic visual display that makes advantage of liquid crystals'(LCs') ability to modulate light.

Fig: LCD

LCs doesn't directly produce light. Therefore, LCDs are considered "passive" display because they require a light source. The LCD in this case uses many memories to display data; those memories are explained below.

DC motor:

Electric motors come in a variety of styles nowadays. A summary of numerous well-known ones is provided in the outline that follows. The two primary categories of motors are AC and DC. To function, AC motors need an alternating current or voltage source (such as the electricity coming from your home's wall outlets). For DC motors to functions, they need a direct current or voltage source (such as the voltage produced by batteries). Both types of power can be used with universal motors. Although the principles of power conversion are the same for both motors, the construction of the motors and the methods used to control the speed and toque produced by each differ.

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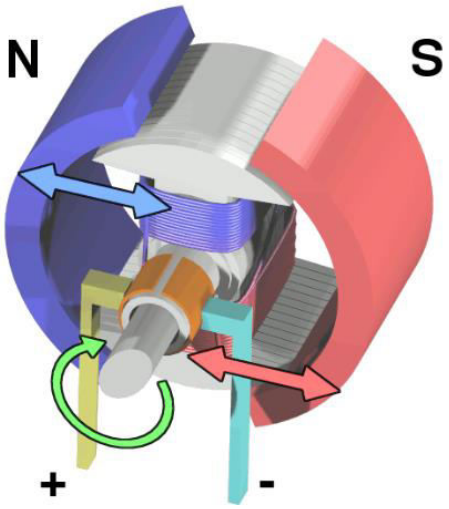

Fig: Dc Motor

Transformer:

A changing magnetic field, which includes a current in the second coil ("secondary"), is produced by an iron or ferrite core; however higher-frequency devices can operate without one. Transformer has two primary functions.

The voltage of the secondary can be higher or lower than the voltage that drives the primary and is determined by the ratio of turns of wire in the two coils.

Fig: Transformer

Arduino IDE:

The Arduino also simplify the task of programming and interacting with a microcontroller. Arduino IDE is used as a text editor we can save with file extension.

III. Conclusion:

In conclusion, a lock system based on an OTP (one-time password) can provide a safe and practical solution to manage entry to a building or room. Each permitted user receives a customised password from the system. You can use this to open the door. This offers improved security, practicality, adaptability, and scalability. When compared to conventional key-based systems, the system can be relatively expensive and is dependent on technology. Therefore, before putting such a system in place, it's crucial to carefully weigh its potential benefits and drawbacks.

IV. Future Scope:

Improved security comparatively to conventional locks, OTP-based door lock systems offer a higher level of protection because the system's unique password is impossible to copy or guess.

Additionally, it stops anyone who has obtained a copy of the key from gaining unauthorised access.

V. Result:

An Arduino Uno, on LCD display, a GSM modern, and an OTP are all components of the aforementioned setup. An OTP will be sent to the mobile device and will also appear on the LCD. If the OTP is correct, the lock will open, the motor will rotate for a short period of time, and then the motor will stop. Once more, the motor will turn in the opposite direction to automatically lock the door. The door wont's open if the OTP is incorrect. The push buttons will be used to enter the OTP.

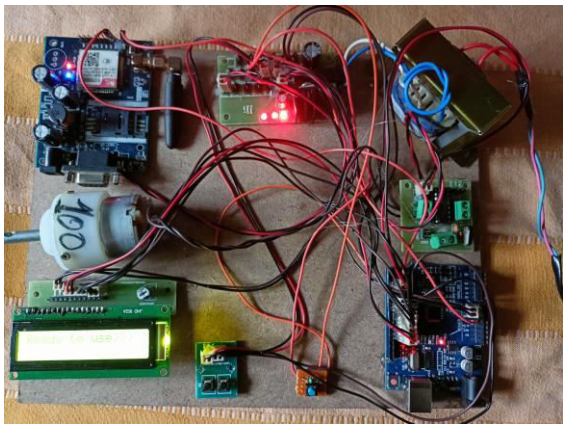

Fig: A Screeshot of the kit arrangement

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