

# VISVESVARAYA TECHNOLOGICAL UNIVERSITY



## MINI PROJECT REPORT ON

### “SIMPLE CODE LOCK”

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# NEW HORIZON COLLEGE OF ENGINEERING

## DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING



### CERTIFICATE

Certified that the mini project work entitled “**SIMPLE CODE LOCK**” carried out by **J.Chandana(1NH18EC719)**, bonafide students of Electronics and Communication Department , New Horizon College of Engineering, Bangalore.

The mini project report has been approved as it satisfies the academic requirements in respect of mini project work prescribed for the said degree.

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## **ACKNOWLEDGEMENT**

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## **ABSTRACT**

Today people are facing more problems about security in all over world, nowadays security is the most essential issue everywhere in the world. So security of everything gains higher and higher importance in recent years. Here in this project, trying to reproduce the comprehensive literature study related to the code locks and gate security systems that are necessary in the fields such as home, industries and vehicle security where possibilities of incursion are increasing day by day. In past days, the research is gone on various door lock security systems like traditional security systems which provide indications using alarm.

In this project we use simple mechanism of flip flops which provide the facility of a small storage. This circuit consists of two flop flops that are given the input of 4 digit code .Each IC consists of two flip flops. The four inputs of flip flops are named as A,B,C and D. For example if the code to be setup is 1234,1 is given to A,2 to B,3 to C,4 toD. The rest other digits are given to reset of the flip flops. When a switch is pressed, It makes the input clock pin high and the state of flip flop is changed. The output of 1 flip flop is given to the input of other flip flop and the input of first flip flop is grounded. Thus when right sequence of keys are pressed the relay energises through the transistor.

# INTRODUCTION

Our Project is basically an electronic combination lock for daily use. This code lock responds only to the right sequence of four digits that can be punched in through the nine keys available on a typical keypad. If an incorrect key is pressed, the lock gets automatically reset. This uses the mechanism of flip flops and not forgetting the relay which acts as a switch. This relay is energized when current passes through it.

# LITERATURE SURVEY

Lock security systems are classified based on technology used as

- 1) Password based (The programmable electronic code lock and it is called as integrated combinational type lock)
- 2) Biometric based (The palmtop recognition is the next step for fingerprint recognition.)
- 3) GSM based (In many door lock security system GSM is used for communication purpose.)
- 4) Smart card based (The security entry way where valid smart card RFID is necessary for passing the door.)
- 5) RFID based (It is the security system used for digital door lock)
- 6) Bluetooth based (Bluetooth based system is a bit like survey house innovations that utilizes Bluetooth function available in smart devices)
- 7) Social networking sites based (The digitalization and safety perspectives were accomplished by utilizing the phone device and web camera.)
- 8) OTP based (The proposed method in latest work does not need administrator's help to access the facility if the user knows OTP technique and has a registered mobile phone)
- 9) Motion detector based (The Motion Detector System working is based on the principle of amount of light falling on the photodiode.)
- 10) VB based (Electronic eye represents the model for capturing the door images with the help of microcontroller to ensure the safety for offices and houses.)
- 11) Combined system (The locker security system is as RFID, FINGERPRINT, PASSWORD and GSM technology containing door locking frameworks)



## **PROPOSED METHODOLOGY**

- ❖ Collecting components
- ❖ Understand the function of each component
- ❖ Construction of the circuit
- ❖ Observation of result and verification

## PROJECT DESCRIPTION

The circuit is built around two CD4013 dual-D flip-flop ICs. The clock pins of the four flip-flops are connected to A, B, C, and D pads. The correct code sequence for activation of relay RL1 is sensitized by clocking points A, B, C, and D in that order. The five remaining switches are connected to reset pad which resets all the flip-flops.

Touching the key pad switch A/B/C/D briefly pulls the clock input pin high and the state of flip-flop is altered. The Q output pin of each flip-flop is wired to D input pin of the next flip-flop while D pin of the first flip-flop is grounded.

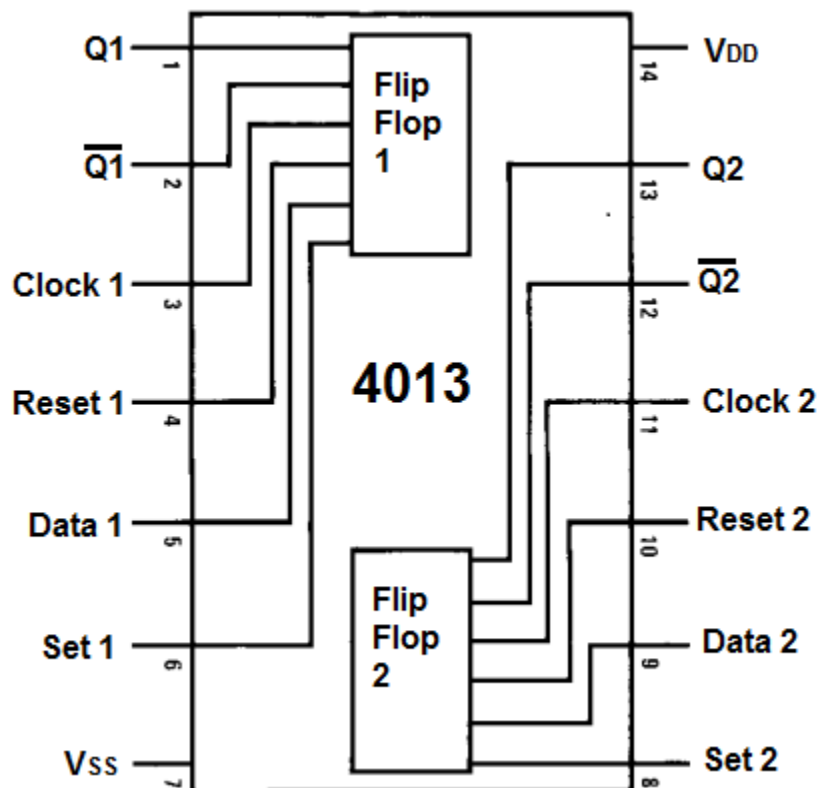
A code lock can be used for numerous applications in which access to a gadget is to be restricted to a limited number of persons. The connected appliance is turned on only when correct four digits code is entered. Any wrong key pressed will be re set the lock. The circuit can be used in number of ways depending upon a person's desire or requirement in various applications for example as access control system, TV child lock, car security system or as an electronic door lock system.

Table 1: components

S.No.	Required Components	Remarks	Quantity
1	IC's	4013	2
2	Transistor	BC557 PNP transistor	1
3	Diode	1NH4001	1
4	LED	Colored	1
5	Resistor	Quarter watt	18k ohm - 1 4.7M Ohm – 5 1k Ohm - 1
6	Capacitor	Ceramic and dielectric	0.1mf,ceramic – 2 220mf ,25v dielectric - 1
7	switches	Push to on	9
8	relay	12v 150 Ohm	1

## IC4013 pin Diagram :

Fig 1: (This IC contains 2 D flip flops as shown in the figure)



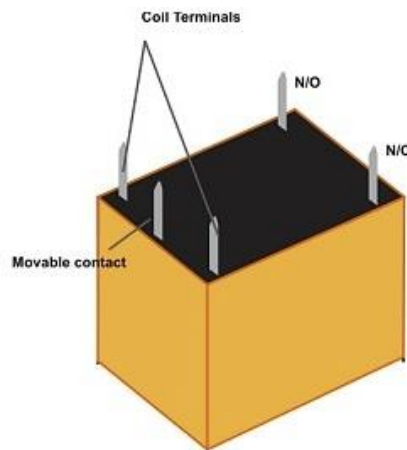
- The power to this chip is 5v supplied from VDD, and VSS to ground. Each flip flop has 6 pins attached to it.
- The clock pin is the pin where we feed a clock signal. The 4013 executes instructions on the rising edge of a clock signal.
- Pin 5 is the data pin. It outputs a data value of either 0 or 1 from the flip flop.
- Pin 4 is the reset pin. If the reset pin alone is HIGH (while the set pin is LOW), this resets the Q and Q pins both to 0.
- Pin 6 is the set pin. If the set pin alone is HIGH (while the reset is LOW), this sets the Q pin to 1 and the Q pin to 0.
- The 2 output pins are Q and Q.
- This gives a description of each of the pins of the chip.

- The 3 input pins are the data, set, and reset pins. The values to these pins dictate the value of the output pins, Q and  $\bar{Q}$ .
- Below is the truth table for the D flip flop pulled from the datasheet of the 4013 chip.

## Relay:

A relay is classified into many types, a standard and generally used relay is made up of electromagnets which in general used as a switch. The signal received from one side of the device controls the switching operation on the other side. So relay is a switch which controls (open and close) circuits electromechanically. The main operation of this device is to make or break contact with the help of a signal without any human involvement in order to switch it ON or OFF. It is mainly used to control a high powered circuit using a low power signal.

Fig 2: Relay



## Diode:

**Diode**, An electrical component that allows the flow of current in only one direction. In circuit diagrams, a diode is represented by a triangle with a line across one vertex. The most common type of diode uses a p n junction. In this type of diode, one material (*n*) in which electrons are charge carriers abuts a second material (*p*) in which holes (places depleted of electrons that act as positively charged particles) act as charge carriers. At their interface, a depletion region is formed across which electrons diffuse to fill holes in the *p*-side. This stops the further flow of electrons. When this junction is forward biased (that is, a positive voltage is applied to the *p*-side), electrons can easily move across the junction to fill the holes, and a current flows through the diode. When the junction is reverse biased (that is, a negative voltage is applied to the *p*-side), the depletion region widens and electrons cannot easily move across. The current remains very small until a certain voltage (the breakdown voltage) is reached and the current suddenly increases.

## Transistor :

There are typically three electrical leads in a transistor, called the emitter, the collector, and the base. An electrical signal applied to the base (or gate) influences the semiconductor material's ability to conduct electrical current, which flows between the emitter and collector in most applications. A voltage source such as a battery drives the current, while the rate of current flow through the transistor at any given moment.

- Driver Modules like Relay Driver, LED driver
- Amplifier modules like Audio amplifiers, signal Amplifier

Fig 3:Transistor

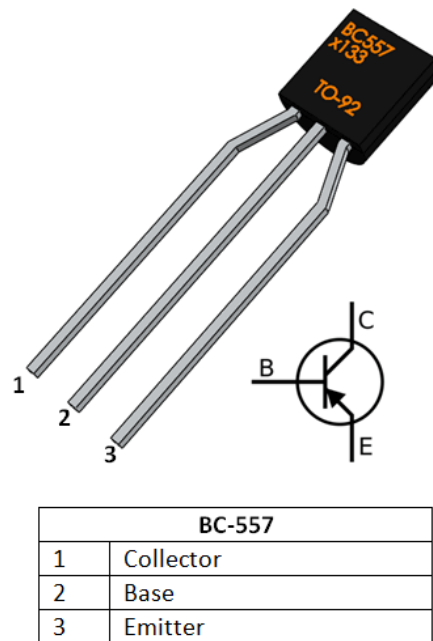


Fig4: Circuit diagram of circuit

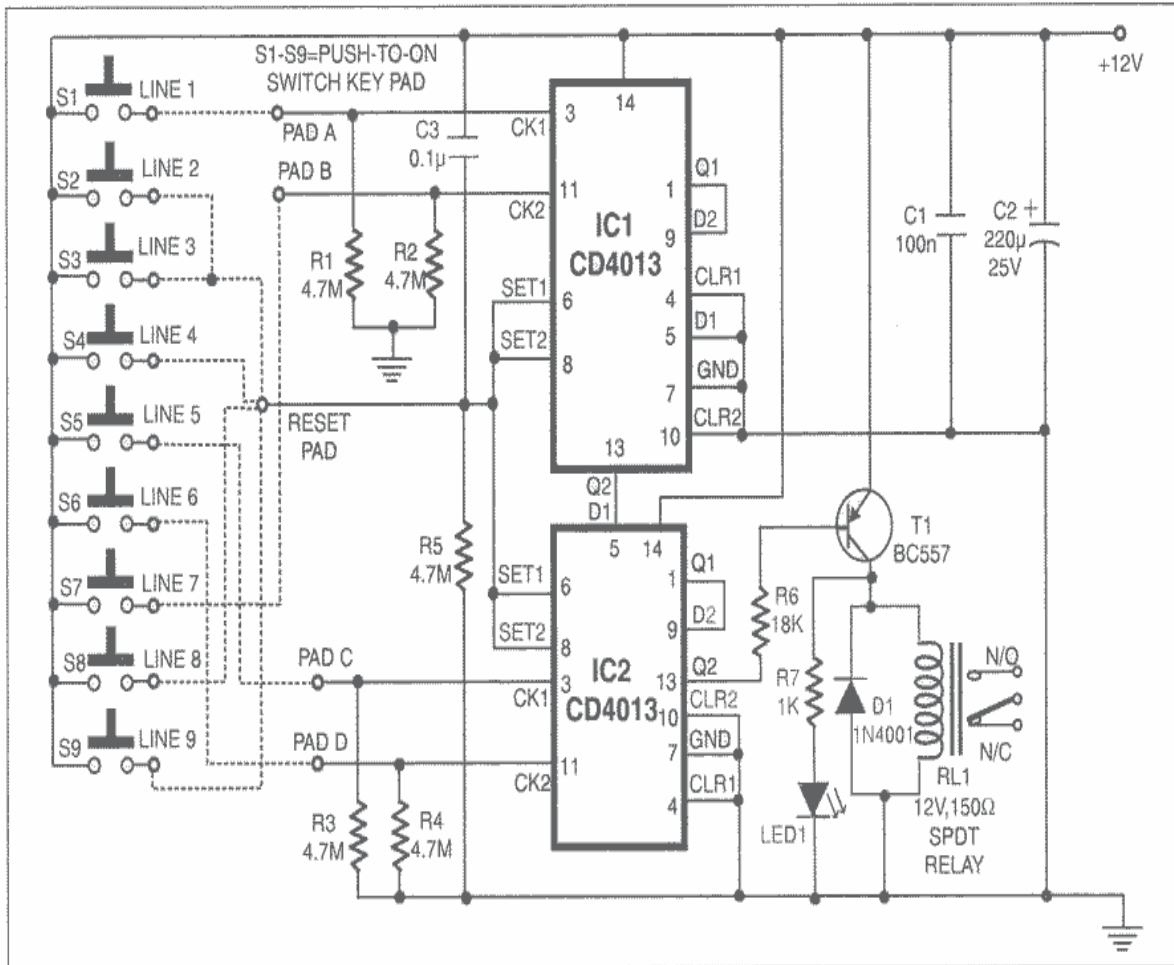


Table 2: Problems

Sr.No.	Problems	
1	Specific Techniques	Can't change the password, during power failure system will gets off.
2	One Time Password	Timeout in few seconds and multiple uses means multiple lockouts.

## **CONCLUSION AND FUTURE SCOPE**

In today's technologically advanced world, autonomous systems are gaining rapid popularity so the advancement in latest technology is continuously and rapidly made on different latest automatic door lock security systems. The need for an advanced door lock security systems using new technologies is increases day by day as security become a very important or serious issue for everybody. Due to the recent trends in various methods of security for home, buildings, companies vehicles etc. There is no need to worry about this security any longer, as automatic security systems are here to deal with it. This paper tries to focus all recent door lock security systems in a comprehensive way.

And as per our knowledge, not a single system is suitable for all types of applications. Day by day technologies are developing and techniques of robbery are also developing. So, need is to develop a new smart and unbreakable technique in further studies.

## **REFERENCES**

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