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**CHAPTER 1: INTRODUCTION**

Code lock is used in the places where we need more security. It can also be used to secure lockers and other protective doors. Digital code locks are very popular, where we need to enter a particular ‘Code’ to open the lock. Password based locking mechanism is a very popular method for safety of our prized possessions. Now with the rapid growth of technology, our locking system is also improved. New better and more functioning Digital code lock have taken the place of old traditional locks, because it is small, secure and reliable to use.

In Digital code lock, this system has master password, pushed button and reset button. In this system the user input password length is restricted to four. In this system there are total 10 pcs of number 0-9 which is used for password for the user. Once all the user input all the four number, if all the four number is correct then the green light will glow and the lock will unlock. If the password is wrong then the red light will glow and lock will not open. For the security purpose this system has another advantage that if the wrong password is input three times then the lock will be permanently locked and only owner can open this locked.

**CHAPTER 2: DIGITAL CODE LOCK**

**2.1 BLOCK DIAGRAM OF CODE LOCK**



**2.2 WORKING OF CODE LOCK**

There are 10 input push button 0-9. When a single button is pressed, code convertor converts the decimal number to BCD code. The BCD code is transferred to code comparator. Comparator gives 1 if the first input digit matches the first digit of the master password otherwise 0. This output is then stored in SIPO register. Similarly, when other buttons are pressed, all the 3 input in comparator (either 1 or 0) is stored in register. This register is connected to output signal circuit (consisting of AND and NOT gate) to shows the output. If all the bite stored on register is 1, green light glows. This indicates that the input password is matched with master password and the lock will unlock. Otherwise, it will remain glowing red, to indicate that lock is still unlock and the input password by the user is wrong.

**2.3 FEATURES**

* Master password is set to 4 digits.
* LEDs are those to display output result.
* Constructed with logic gates only.
* It has reset button.

**2.4 COMPONENTES REQUIRED**

* Push button (to input to circuit)
* D flip flops (to temporary store inputs)
* OR gates (in code converts, register D flip flop)
* AND gate (in comparator, I output circuit)
* LEDs (in output circuit)
* Investor / buffer (in comparator, in output circuit)

**CIRCUIT**

This circuit is constructed on **CIRCUITVERSE** software.



**FLOW CHART**



**CHAPTER 3: CONCLUSION**

**3.1 FUTURE SCOPE**

The digital code lock is more secure specially with the features like alert. Password of only four characters, we get 10,000 possible combination. It is simple to use without need of any physical keys. Clearly the future use of these digital code locks is increasing.

**3.2 POSSIBLE LIMITATIONS**

1) There can be switch bounce that can result in multiple input signals.

2) It's only safe for the few people who know the pin but by mistake if any with any other person can know this could be prove as harmful and bad for that.

3) It operates on electricity or single battery, during power failure it won’t work.

**3.3 EXTENDED FEATURES**

Our present lock can have additional features like

1) Permanent locking after three trials: it can be done by using registers.

2) Bouncing mechanism: switch bouncing can be overcome by using regiters and capacitors.

**REFERENCE**

* FUNDAMENTAL OF DIGITAL CIRCUITS – Book by A. ANAND KUMAR
* DIGITAL DESIGN – Book by MORRIS MANO