

**Department of Computer Science & Engineering**

**Lab Final Report**

Course Title: Introduction to Embedded Systems Lab

Course Code: CSE3028, Section-2

**Submitted to**

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**Project Title: Password Based Door Lock System using 8051 Microcontroller**

**Project Documentation, Overview**:

Password Based Door Lock System using [8051 Microcontroller](https://www.electronicshub.org/8051-microcontroller-introduction/) is a simple project where a secure password will act as a door unlocking system. Traditional lock systems using mechanical lock and key mechanism are being replaced by new advanced techniques of locking system. These techniques are an integration of mechanical and electronic devices and are highly intelligent. One of the prominent features of these innovative lock systems is their simplicity and high efficiency.

Such an automatic lock system consists of electronic control assembly, which controls the output load through a password. This output load can be a motor or a lamp or any other mechanical/electrical load.

Here, we developed an electronic code lock system using [8051 Microcontroller](https://www.electronicshub.org/8051-microcontroller-introduction/)(a Password based Door Lock System using 8051 Microcontroller), which provides control to the actuating the load. It is a simple embedded system with input from the keyboard and the output being actuated accordingly.

This system demonstrates a Password based Door Lock System using 8051 Microcontroller, wherein once the correct code or password is entered, the door is opened and the concerned person is allowed access to the secured area. Again, if another person arrives, it will ask to enter the password. If the password is wrong, then door would remain closed, denying access to the person.

**Components:**

• 1 AT89C51 Microcontroller

• 1 Quartz Crystal

• 1 Keypad phone

• 2 Generic non-electrolytic Capacitors

• 1 Generic Resistor

• 1 Simple DC Motor

• 1 LCD (LM032L)

• Connecting Wires

**Coding Part:**

#include<reg51.h>

//4\*3 keypad connection

//row

sbit r1=P1^0;

sbit r2=P1^1;

sbit r3=P1^2;

sbit r4=P1^3;

//colum

sbit c1=P1^4;

sbit c2=P1^5;

sbit c3=P1^6;

//lcd control lines

sbit rs=P3^0;

sbit rw=P3^1;

sbit en=P3^2;

//motor connection

sbit motp=P3^3;

sbit motn=P3^4;

//user function

void lcdcmd(unsigned char);

void lcddat(unsigned char);

void lcddis(unsigned char \*,unsigned char);

void delay();

void check();

unsigned char pwd[4],x;

//Main Function

void main()

{

    back:lcdcmd(0x38);

    lcdcmd(0x01);

    lcdcmd(0x0c);

    lcdcmd(0x80);

    lcddis("DOOR LOCKED",11);

    delay();

    delay();

    delay();

    lcdcmd(0x01);

    lcddis("ENTER PASSWORD",14);

    lcdcmd(0xc0);

    lcdcmd(0x0F);

    while(1)

    {

        //row 1

        r1=0;r2=1;r3=1;r4=1;

        if(c1==0)

        {

            pwd[x]='1';

            delay();delay();delay();delay();

            lcddat('\*');

            x=x+1;

        }

        if(c2==0)

        {

            pwd[x]='2';

            delay();delay();delay();delay();

            lcddat('\*');

            x=x+1;

        }

        if(c3==0)

        {

            pwd[x]='3';

            delay();delay();delay();delay();

            lcddat('\*');

            x=x+1;

        }

        //row 2

        r1=1;r2=0;

        if(c1==0)

        {

            pwd[x]='4';

            delay();delay();delay();delay();

            lcddat('\*');

            x=x+1;

        }

        if(c2==0)

        {

            pwd[x]='5';

            delay();delay();delay();delay();

            lcddat('\*');

            x=x+1;

        }

        if(c3==0)

        {

            pwd[x]='6';

            delay();delay();delay();delay();

            lcddat('\*');

            x=x+1;

        }

        //row 3

        r1=1;r2=1;r3=0;

        if(c1==0)

        {

            pwd[x]='7';

            delay();delay();delay();delay();

            lcddat('\*');

            x=x+1;

        }

        if(c2==0)

        {

            pwd[x]='8';

            delay();delay();delay();delay();

            lcddat('\*');

            x=x+1;

        }

        if(c3==0)

        {

            pwd[x]='9';

            delay();delay();delay();delay();

            lcddat('\*');

            x=x+1;

        }

        //row 4

        r1=1;r2=1;r3=1;r4=0;

        if(c1==0)

        {

            motp=0;

            motn=1;

            x=0;

            goto back;

        }

        if(c2==0)

        {

            pwd[x]='0';

            delay();delay();delay();delay();

            lcddat('\*');

            x=x+1;

        }

        if(c3==0)

        {

            check();

            delay();

            delay();

            delay();

        }

        r4=1;

    //while

    }

//main

}

void check()

{

    if(pwd[0]=='1'&&pwd[1]=='2'&&pwd[2]=='3'&&pwd[3]=='4')

    {

        motp=1;

        motn=0;

        lcdcmd(0x01);

        lcddis("PASSWORD MATCHED",16);

        lcdcmd(0xc0);

        lcddis("DOOR UNLOCKED",13);

        delay();

    }

    else

    {

        lcdcmd(0x01);

        lcddis("WRONG PASSWORD",14);

        lcdcmd(0xc0);

        lcddis("TRY AGAIN",9);

        delay();

    }

}

void lcdcmd(unsigned char val)

{

    P2=val;

    rs=0;

    rw=0;

    en=1;

    delay();

    en=0;

}

void lcddat(unsigned char dat)

{

    P2=dat;

    rs=1;

    rw=0;

    en=1;

    delay();

    en=0;

}

void lcddis(unsigned char \*s,unsigned char r)

{

    unsigned char w;

    for(w=0;w<r;w++)

    {

        lcddat(s[w]);

        delay();

    }

}

void delay()

{

    unsigned char i, j;

    for(i=0;i<250;i++)

    {

        for(j=0;j<20;j++);

    }

}

**Design:**

