Online Assignment2 (WTP2)

Department: ***E****lectronics &* ***C****ommunication Engineering.*
School:
Course Code: **ECE397**
Course Title: Workshop on Microcontroller Based Data Logger System.
Time duration: N.A. Max. Marks: **50** *Section:* **EE021** Marks Obtained:

Student Name: Mohit Rawat

Reg. Number: __11904463___

Roll Number: ____15_____

Q. 8051 based project, along with the project report containing the following:

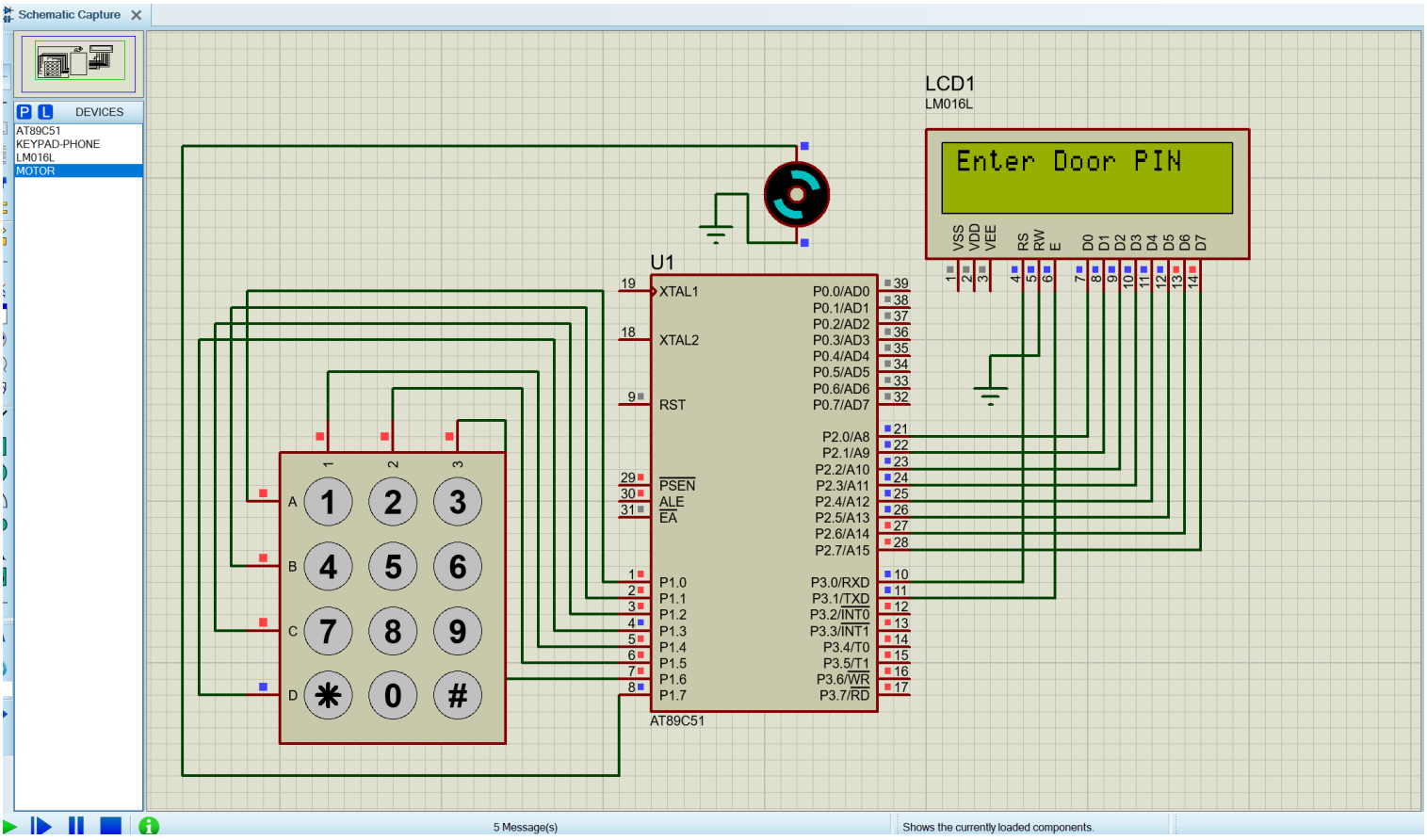
Title: Door Password System.

***Objective*: To make door system more secure by adding password on it.**

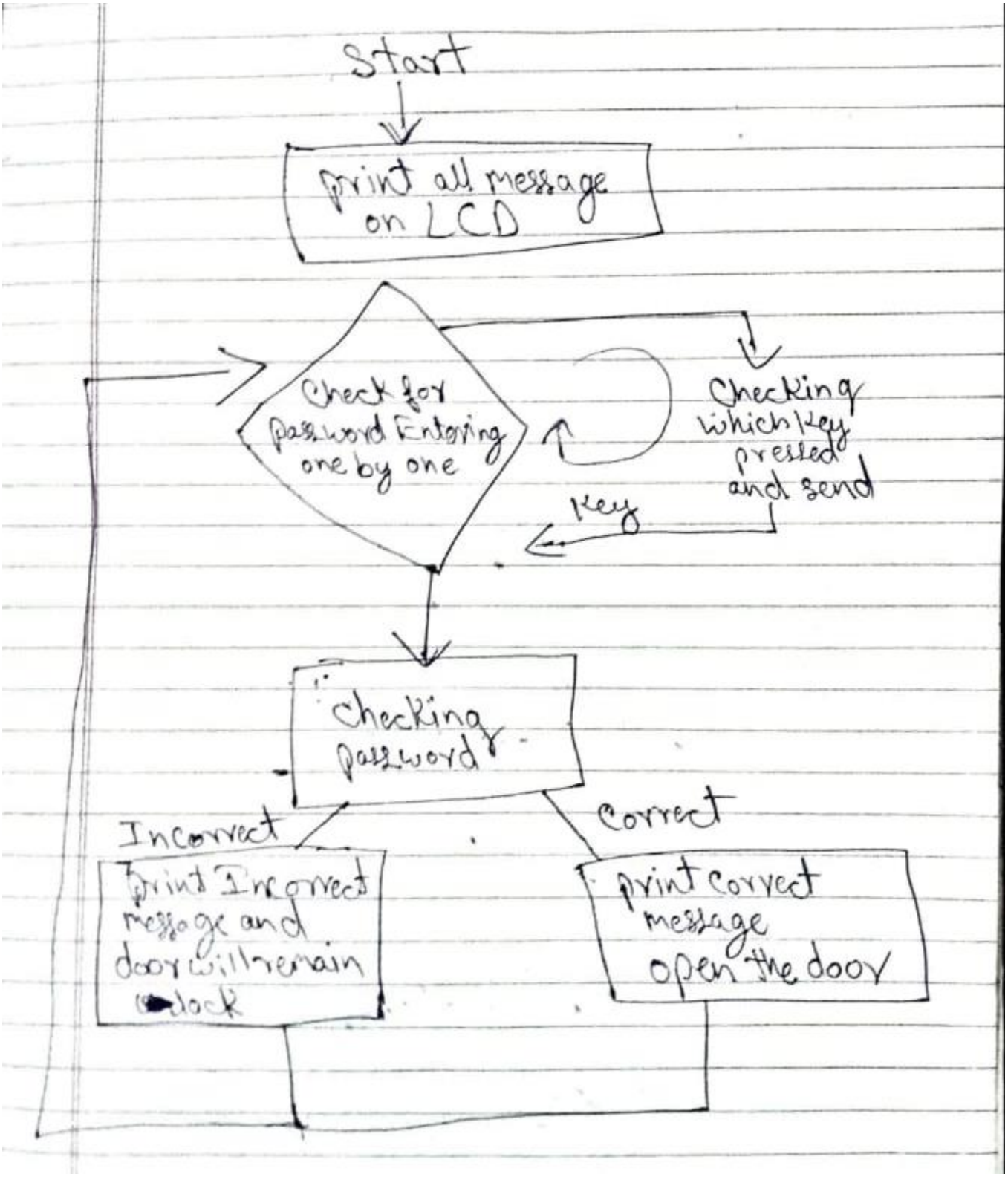
***Components (Hardware)*: 8051 micro-Controller,** Keypad-Phone **, LCD, Motor.**

***Software tools requirements*: Proteus & Keil.**

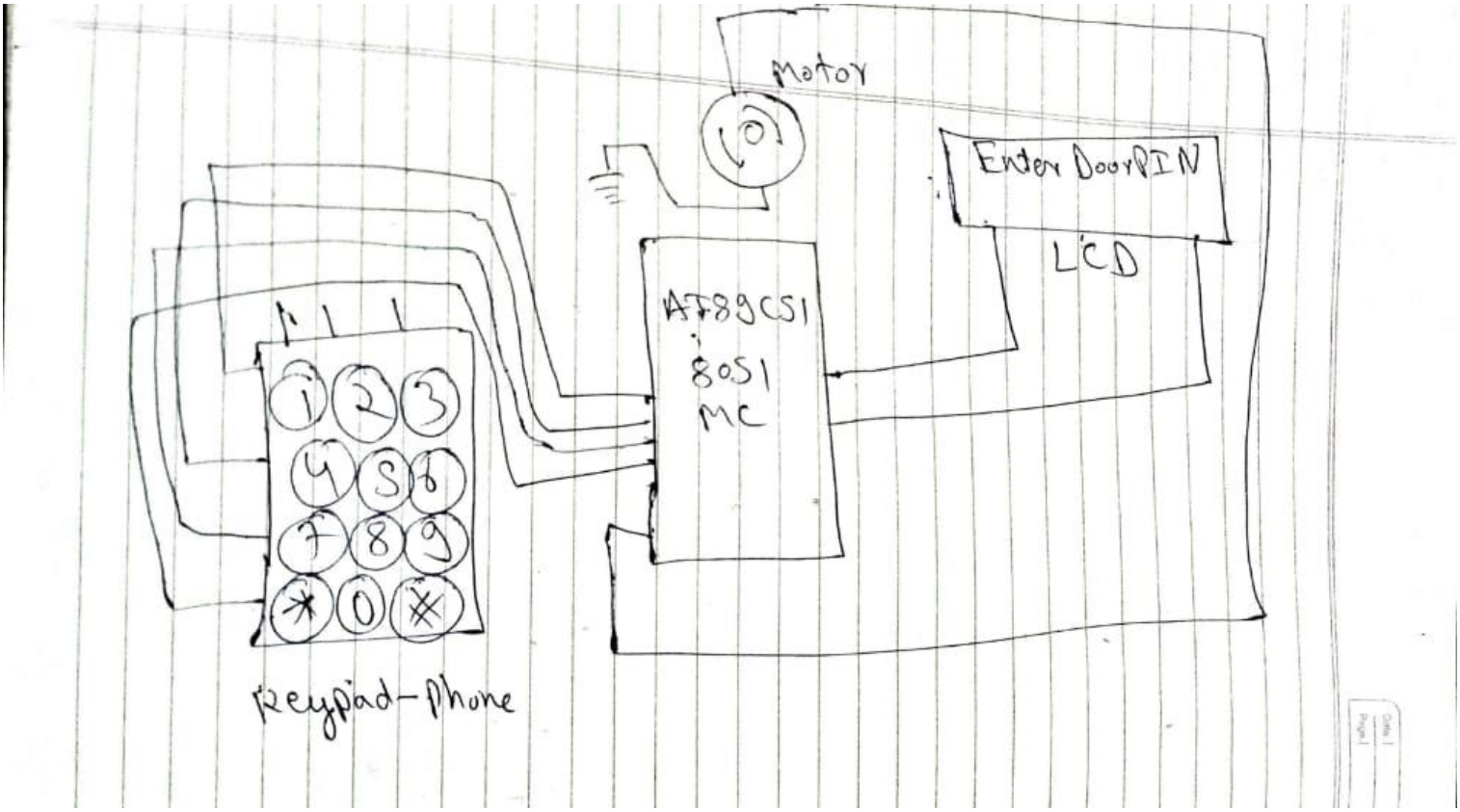
Circuit diagram:



block diagram:



Flow chart/Approach of the overall project:



Introduction:

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This projct is all about security related to door system. This project is made with Microcontroller 8051 which is a general perpose microcontroller, LCD (16x2), Keypad-phone and motor and programming is written in C language.

The software used are Proteus which is used to make all circuits and keil which is used to write code and to build Hex file by which microcontroller will work.

By using digital system in door, we can get rid from key to missed somewhere or stolen by someone and later misuse.

The door will open only when the correct password will be entered otherwise door will remain closed.

Application:

i) Secure main door or farthe we can connect it with mobile Application.

ii) Almira lock to secure important documents or jewellry.

Theory related to all the components used :

8051 Microcontroller.

The 8051 microcontroller is a general perpose microcontroller use in many small application like traffic light, micro oven, washing machine etc. Microcontroller have inbuild RAM & ROM which is suitable for small projects although it can make some complecate procecks also.

Keypad – Phone (4x3)

Keypad – phone is the basic and simple technique keypad which used row and colomn to detect which key is pressed and send signal to microcontroller.

LCD (LM016L) (16x2)

A simple 16x2 Liquid Crystal Display can handle 8bit number or command at a time and can display 32 character at once at whole display.

Motor:

simple motor to unlock or lock door operated by Microcontroller.

Program/Sketch/Code:

Door_Password_System.c

```c
#include<reg51.h>
#define LCD P2
sbit RS = P3^0;
sbit E = P3^1;

sbit key_r1 = P1^0;
sbit key_r2 = P1^1;
sbit key_r3 = P1^2;
sbit key_r4 = P1^3;

sbit key_c1 = P1^4;
sbit key_c2 = P1^5;
sbit key_c3 = P1^6;

sbit door_motor = P1^7;

unsigned char pin[] = {"9885"};
unsigned char epin[4];

void delay(unsigned int time){
  unsigned int i, j;
  for(i=1;i<time;i++)
  for(j=1;j<1275;j++);
}

void lcd_command(unsigned char c){
  LCD = c;
  RS = 0;
  E = 1;
  delay(4);
  E = 0;
}
void print(unsigned char d){
    LCD = d;
    RS = 1;
    E = 1;
    delay(4);
    E = 0;
}
void init_lcd(){
  lcd_command(0x38);
  lcd_command(0x01);
  lcd_command(0x06);
```

Door_Password_System.c

```
40 void init_lcd(){
41   lcd_command(0x38);
42   lcd_command(0x01);
43   lcd_command(0x06);
44   lcd_command(0x0c);
45   lcd_command(0x80);
46 }
47 void printl(unsigned char* str){
48   unsigned int i=0;
49   while(str[i] != '\0'){
50     print(str[i]);
51     i++;
52   }
53 }
54
55 unsigned char GetKey(){
56   while(1){
57     key_r1 = 0;
58     key_r2 = 1;
59     key_r3 = 1;
60     key_r4 = 1;
61     if(key_c1 == 0){
62       return '1';
63     }
64     if(key_c2 == 0){
65       return '2';
66     }
67     if(key_c3 == 0){
68       return '3';
69     }
70     key_r1 = 1;
71     key_r2 = 0;
72     key_r3 = 1;
73     key_r4 = 1;
74     if(key_c1 == 0){
75       return '4';
76     }
77     if(key_c2 == 0){
78       return '5';
79     }
80     if(key_c3 == 0){
81       return '6';
82     }
```

Door_Password_System.c

```
79     }
80     if(key_c3 == 0){
81       return '6';
82     }
83     key_r1 = 1;
84     key_r2 = 1;
85     key_r3 = 0;
86     key_r4 = 1;
87     if(key_c1 == 0){
88       return '7';
89     }
90     if(key_c2 == 0){
91       return '8';
92     }
93     if(key_c3 == 0){
94       return '9';
95     }
96     key_r1 = 1;
97     key_r2 = 1;
98     key_r3 = 1;
99     key_r4 = 0;
100    if(key_c1 == 0){
101      return '*';
102    }
103    if(key_c2 == 0){
104      return '0';
105    }
106    if(key_c3 == 0){
107      return '#';
108    }
109    delay(20);
110  }
111 }
112
113 void checkPassword(){
114   init_lcd();
115   if(epin[0] == pin[0] && epin[1] == pin[1] && epin[2] == pin[2] && epin[3] == pin[3]){
116     printl("Correct PIN");
117     door_motor = 1;
118     lcd_command(0xc0);
119     printl("Door Opened");
120   }
121   else{
```

Door_Password_System.c

```
104       return '0';
105     }
106     if(key_c3 == 0){
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113 void checkPassword(){
114   init_lcd();
115   if(epin[0] == pin[0] && epin[1] == pin[1] && epin[2] == pin[2] && epin[3] == pin[3]){
116     printl("Correct PIN");
117     door_motor = 1;
118     lcd_command(0xc0);
119     printl("Door Opened");
120   }
121   else{
122     printl("Incorrect PIN");
123     lcd_command(0xc0);
124     printl("Try Again Later");
125   }
126   delay(1000);
127   door_motor = 0;
128 }
129 
130 void main(){
131 while(1){
132   unsigned int i = 0;
133   door_motor = 0;
134   init_lcd();
135   printl("Enter Door PIN");
136   lcd_command(0xc0);
137   while(pin[i] != '\0'){
138     epin[i] = GetKey();
139     print('*');
140     delay(50);
141     i++;
142   }
143   checkPassword();
144 }
145 }
146 
```

```
#include<reg51.h>
#define LCD P2
sbit RS = P3^0;
sbit E = P3^1;

sbit key_r1 = P1^0;
sbit key_r2 = P1^1;
sbit key_r3 = P1^2;
sbit key_r4 = P1^3;

sbit key_c1 = P1^4;
sbit key_c2 = P1^5;
sbit key_c3 = P1^6;

sbit door_motor = P1^7;

unsigned char pin[] = {"9885"};
unsigned char epin[4];
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void delay(unsigned int time){
	unsigned int i, j;
	for(i=1;i<time;i++)
	for(j=1;j<1275;j++);
}

void lcd_command(unsigned char c){
	LCD = c;
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void print(unsigned char d){
		LCD = d;
		RS = 1;
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		delay(4);
		E = 0;
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void init_lcd(){
	lcd_command(0x38);
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void printl(unsigned char* str){
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		i++;
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unsigned char GetKey(){
	while(1){
		key_r1 = 0;
		key_r2 = 1;
		key_r3 = 1;
		key_r4 = 1;
		if(key_c1 == 0){
			return '1';
		}
		if(key_c2 == 0){
			return '2';
		}
		if(key_c3 == 0){
			return '3';
```

```
                }
                key_r1 = 1;
                key_r2 = 0;
                key_r3 = 1;
                key_r4 = 1;
                if(key_c1 == 0){
                        return '4';
                }
                if(key_c2 == 0){
                        return '5';
                }
                if(key_c3 == 0){
                        return '6';
                }
                key_r1 = 1;
                key_r2 = 1;
                key_r3 = 0;
                key_r4 = 1;
                if(key_c1 == 0){
                        return '7';
                }
                if(key_c2 == 0){
                        return '8';
                }
                if(key_c3 == 0){
                        return '9';
                }
                key_r1 = 1;
                key_r2 = 1;
                key_r3 = 1;
                key_r4 = 0;
                if(key_c1 == 0){
                        return '*';
                }
                if(key_c2 == 0){
                        return '0';
                }
                if(key_c3 == 0){
                        return '#';
                }
                delay(20);
        }
}

void checkPassword(){
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        if(epin[0] == pin[0] && epin[1] == pin[1] && epin[2] == pin[2] && epin[3] == pin[3]){
                printl("Correct PIN");
                door_motor = 1;
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                lcd_command(0xc0);
                printl("Door Opened");
        }
        else{
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                printl("Try Again Later");
        }
        delay(1000);
        door_motor = 0;
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void main(){
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        unsigned int i = 0;
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        init_lcd();
        printl("Enter Door PIN");
        lcd_command(0xc0);
        while(pin[i] != '\0'){
          epin[i] = GetKey();
                print('*');
                delay(50);
                i++;
        }
        checkPassword();
}
}
```
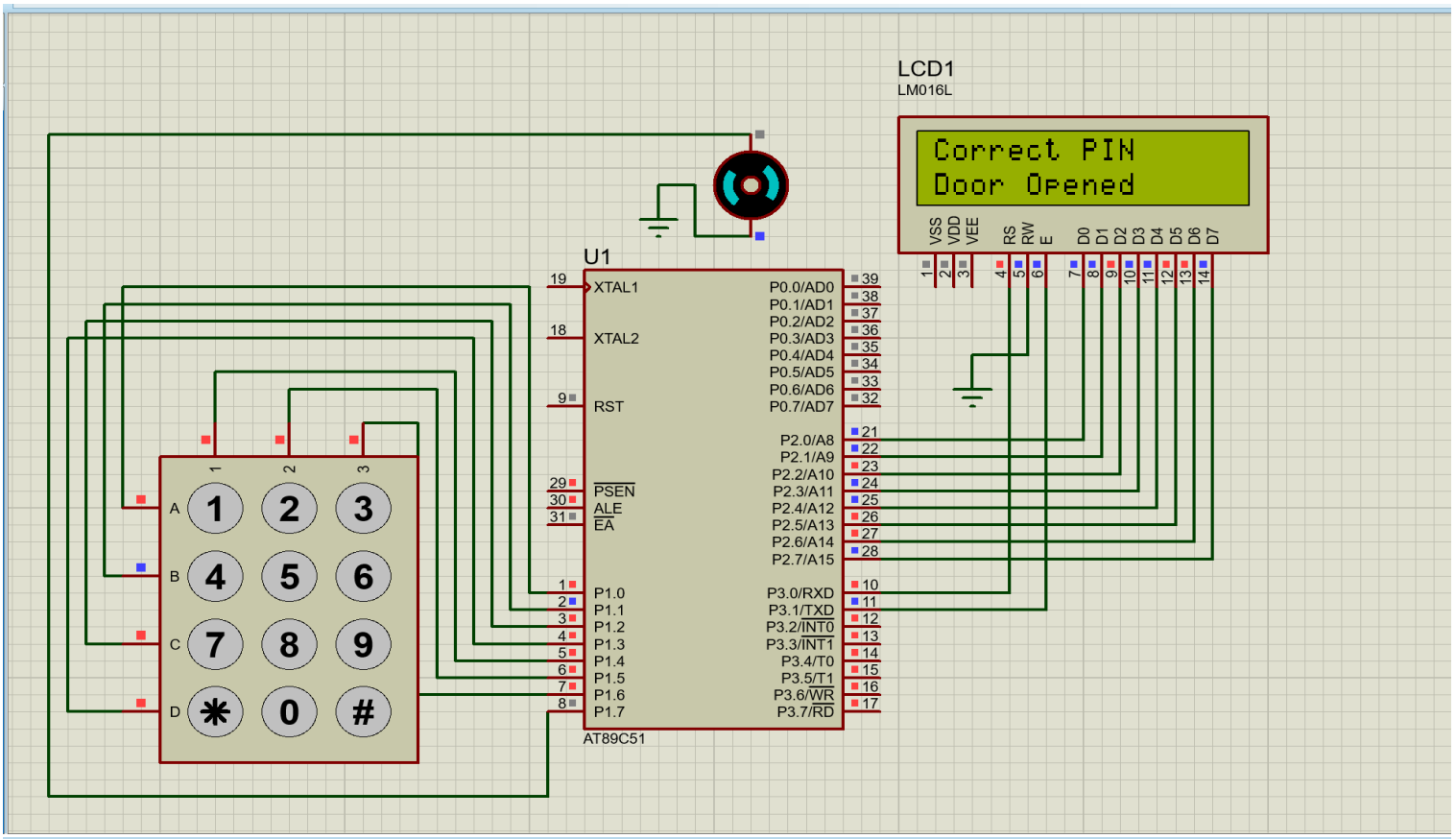
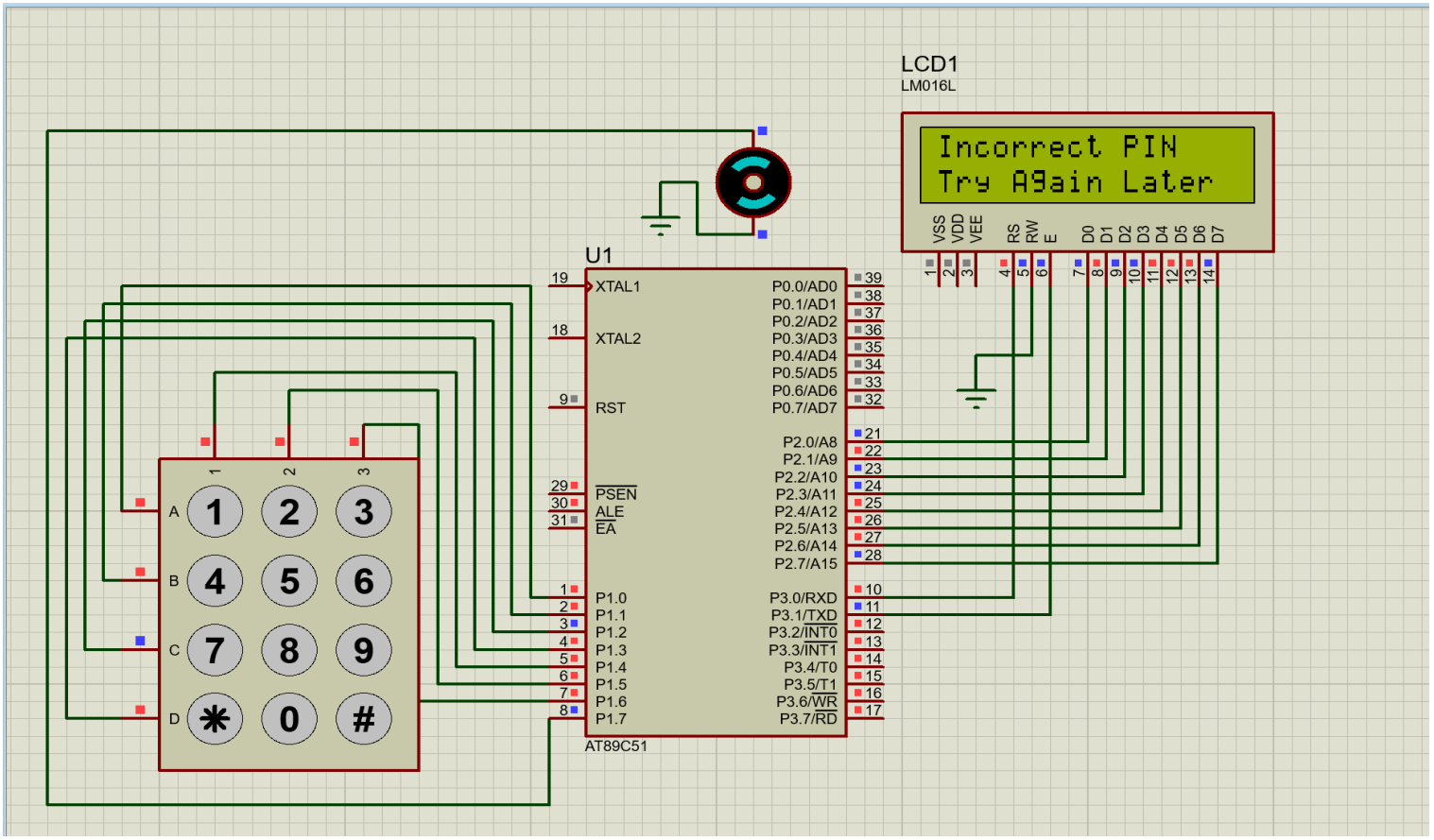

Result and Discussion:





Learning outcome:

1. **Learnt about the 8051 micro-Controller.**
2. **Learnt about the KEYPAD-PHONE.**
3. **Learnt about the LCD (LM016L).**
4. **Learnt about the motor.**
5. **Learnt to do code using C language.**
6. **Learnt circuit design in Proteus.**

References:

https://github.com/kmhmubin/Password-based-doorlock-system-in-8051-microprocessor

https://youtu.be/6WdycpGuhRY