

DOOR LOCK SYSTEM

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CONTENT

1. Introduction
2. Need of topic
3. Components
4. Component Information
5. Use Case Diagram
6. Code
7. Applications
8. Conclusion
9. References

INTRODUCTION

smart lock

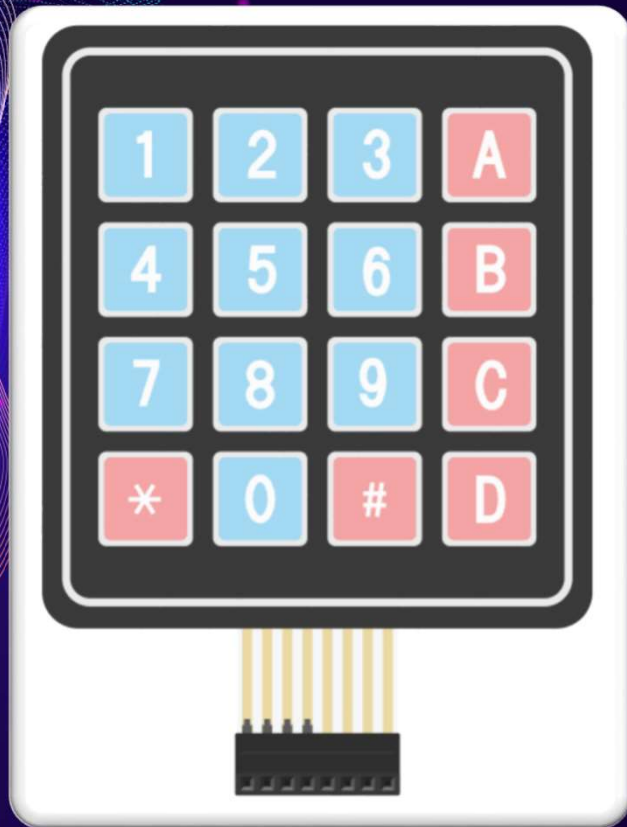
A smart lock is an electronic and mechanical locking device that opens wirelessly with an authorized users' authentication.

NEED OF TOPIC

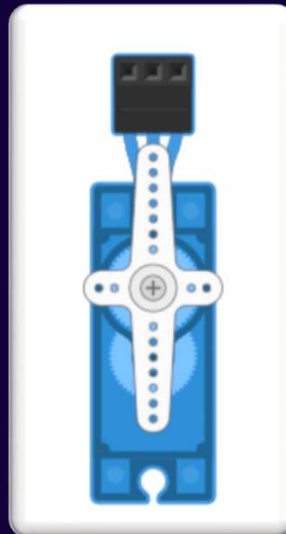
- 1 . To Increase Accessibility Without Compromising Security .
- 2 . Simplify Home Security .
- 3 . To have So Many Options to Lock and Unlock Your Property .

The background is a dark purple gradient. It features several sets of concentric, wavy lines in shades of purple and blue, creating a sense of depth and movement. Scattered throughout the background are numerous small, glowing dots in various shades of purple and blue, resembling a starry night sky or a digital data field.

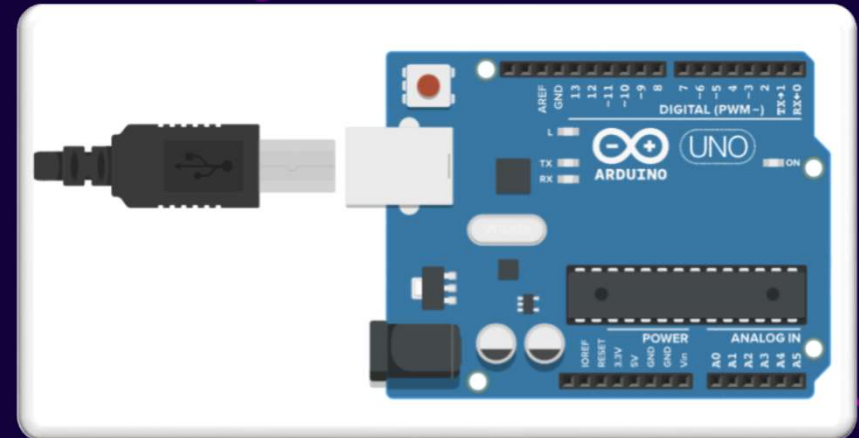
COMPONENTS



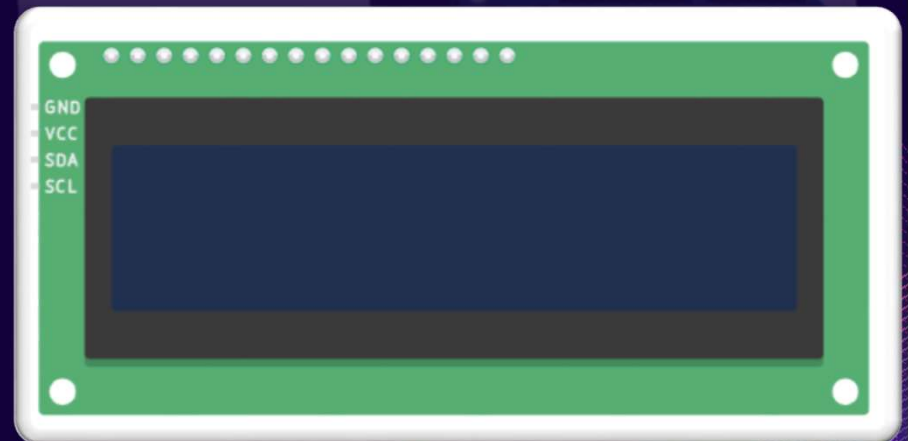
Keypad 4 x 4



Micro Servo



Arduino Uno

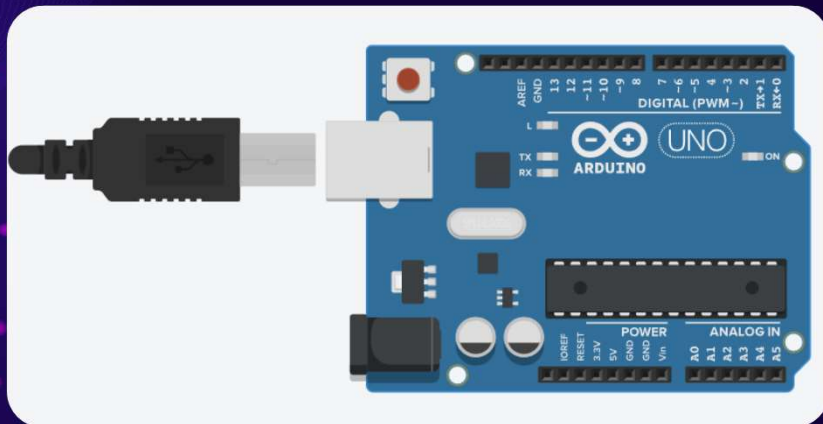


LCD 16 x 2 (I2C)



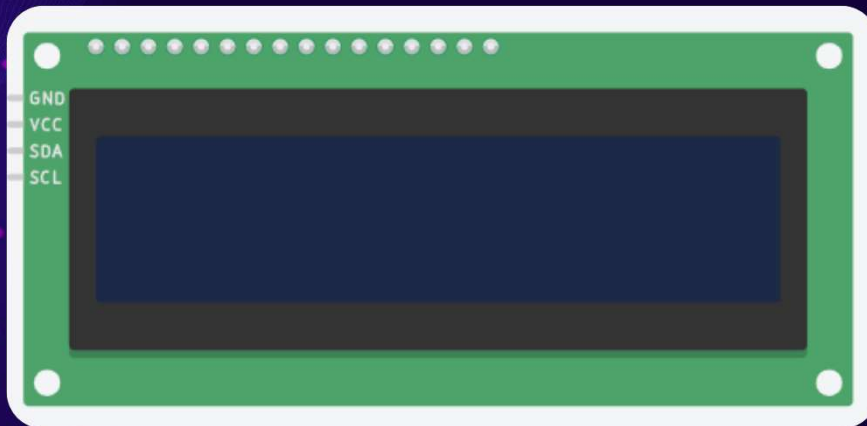
COMPONENT INFORMATION

Arduino Uno



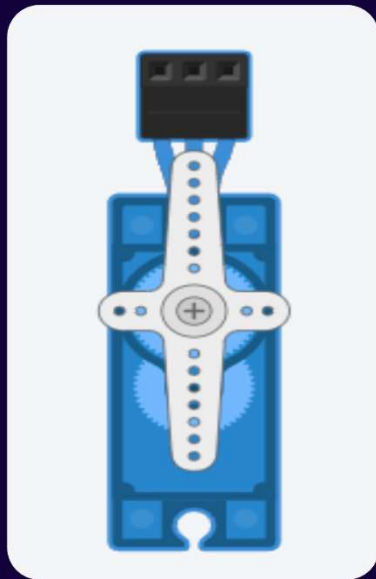
The Arduino Uno is an open-source microcontroller board based on the Microchip ATmega328P microcontroller and developed by Arduino.cc. The board is equipped with sets of digital and analog input/output (I/O) pins

LCD 16×2



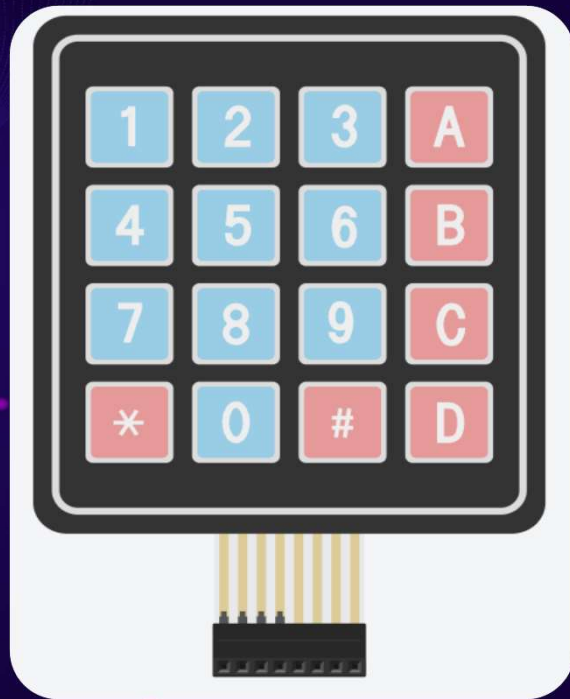
An electronic device that is used to display data and the message is known as **LCD 16×2**. As the name suggests, it includes 16 Columns & 2 Rows so it can display 32 characters ($16 \times 2 = 32$)

Micro Servo



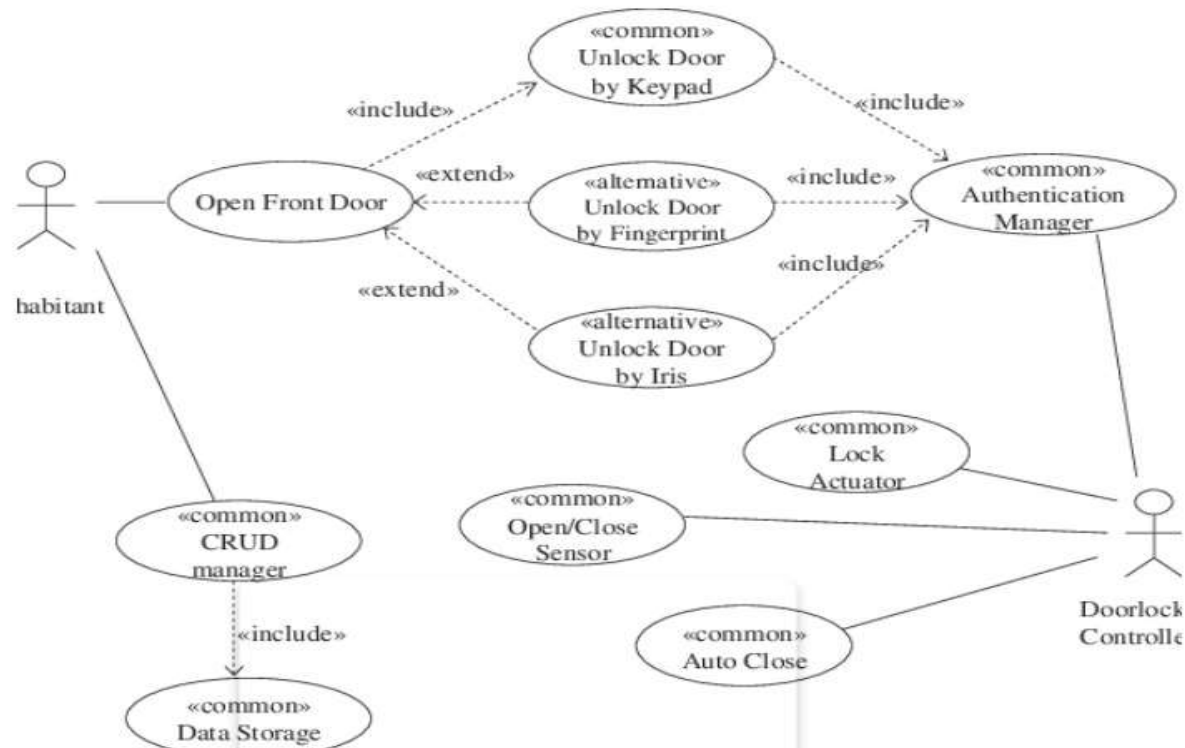
Micro Servo Motor SG90 is a **tiny and lightweight** server motor with **high output power**. Servo can rotate approximately **180** degrees (90 in each direction)

Keypad 4 x 4



The 4x4 matrix keypad is a simple mechanism that resembles the numeric input on your computer keyboard, except that it has an additional '*', '#' and 4 other auxiliary buttons that can be used for various functions in the application.

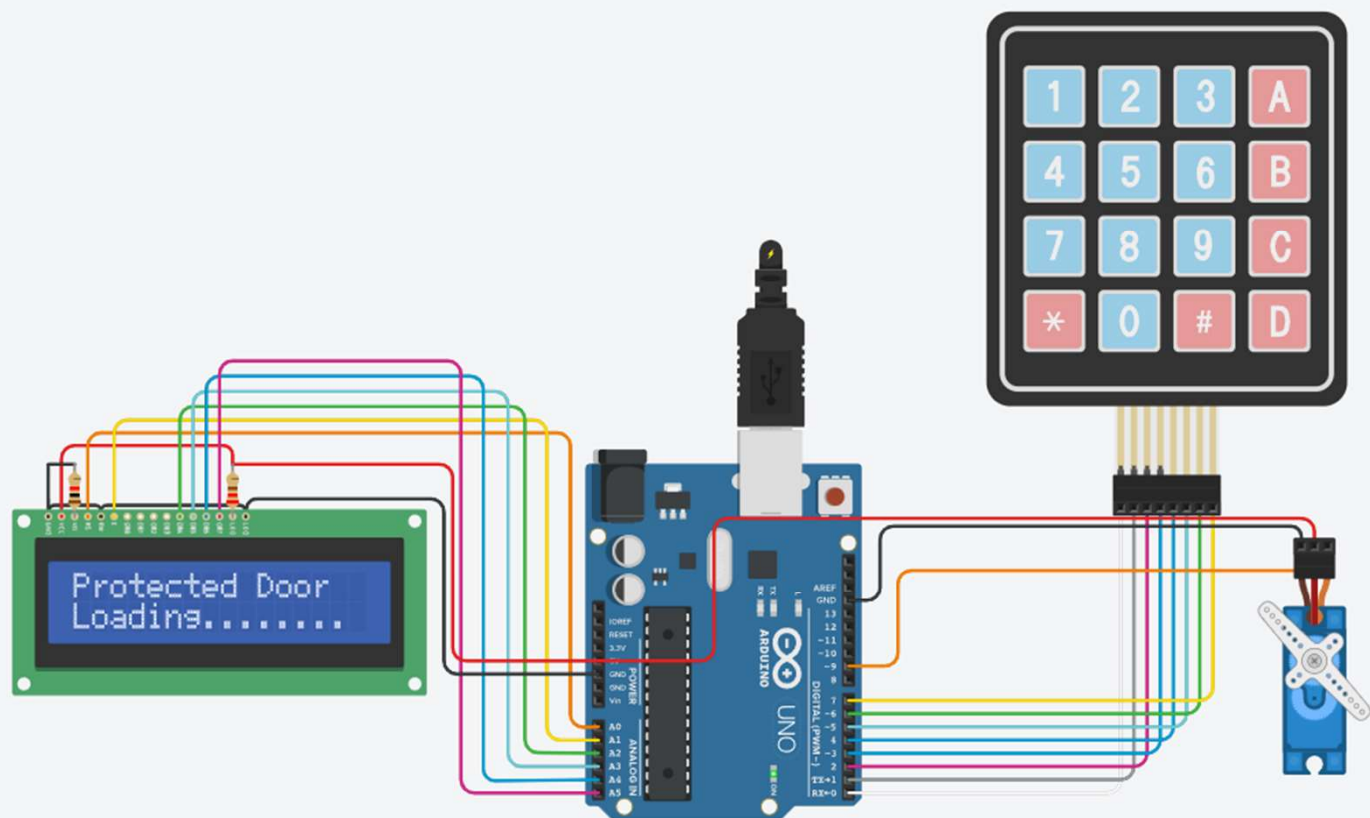
USE CASE DIAGRAM





CIRCUIT

The image features a dark purple background with a complex, abstract pattern of glowing, wavy lines in shades of blue and purple. These lines form a central, swirling shape that resembles a stylized circuit or a digital signal. Scattered throughout the background are numerous small, glowing dots in various colors, including purple, blue, and pink, creating a starry or digital space effect. The word "CIRCUIT" is prominently displayed in the center in a bold, white, sans-serif font.





CODE

```

1  #include <Keypad.h>
2  #include <LiquidCrystal.h>
3  #include <Servo.h>
4
5  #define Password_Length 5
6
7  Servo myservo;
8  LiquidCrystal lcd(A0, A1, A2, A3, A4, A5);
9
10 int pos = 0;
11
12 char Data[Password_Length];
13 char Master[Password_Length] = "1234";
14 byte data_count = 0, master_count = 0;
15
16 bool Pass_is_good;
17 bool door = false;
18 char customKey;
19
20 /*---preparing keypad---*/
21
22 const byte ROWS = 4;
23 const byte COLS = 4;
24 char keys[ROWS][COLS] = {
25   {'1', '2', '3', 'A'},
26   {'4', '5', '6', 'B'},
27   {'7', '8', '9', 'C'},
28   {'*', '0', '#', 'D'}
29 };
30
31
32 byte rowPins[ROWS] = {0, 1, 2, 3};
33 byte colPins[COLS] = {4, 5, 6, 7};
34
35 Keypad customKeypad( makeKeymap(keys), rowPins, colPins, ROWS, COLS);
36
37
38 /*--- Main Action ---*/
39 void setup()
40 {
41   myservo.attach(9, 2000, 2400);
42   ServoClose();

```

```

44   lcd.begin(16, 2);
45   lcd.print("Protected Door");
46   loading("Loading");
47   lcd.clear();
48 }
49
50
51 void loop()
52 {
53   if (door == true)
54   {
55     customKey = customKeypad.getKey();
56     if (customKey == '#')
57     {
58       lcd.clear();
59       ServoClose();
60       lcd.print("Door is closed");
61       delay(3000);
62       door = false;
63     }
64   }
65   else
66     Open();
67 }
68
69
70 void loading (char msg[]) {
71   lcd.setCursor(0, 1);
72   lcd.print(msg);
73
74   for (int i = 0; i < 9; i++) {
75     delay(1000);
76     lcd.print(".");
77   }
78 }
79
80 void clearData()
81 {
82   while (data_count != 0)
83   {
84     Data[data_count--] = 0;
85   }

```



```

86     return;
87 }
88
89 void ServoClose()
90 {
91     for (pos = 90; pos >= 0; pos -= 10) {
92         myservo.write(pos);
93     }
94 }
95
96 void ServoOpen()
97 {
98     for (pos = 0; pos <= 90; pos += 10) {
99         myservo.write(pos);
100     }
101 }
102
103 void Open()
104 {
105     lcd.setCursor(0, 0);
106     lcd.print("Enter Password");
107
108     customKey = customKeypad.getKey();
109     if (customKey)
110     {
111         Data[data_count] = customKey;
112         lcd.setCursor(data_count, 1);
113         lcd.print(Data[data_count]);
114         data_count++;
115     }
116
117     if (data_count == Password_Length - 1)
118     {
119         if (!strcmp(Data, Master))
120         {
121             lcd.clear();
122             ServoOpen();
123             lcd.print(" Door is Open ");
124             door = true;
125             delay(5000);
126             loading("Waiting");
127             lcd.clear();

```

```

128         lcd.print(" Time is up! ");
129         delay(1000);
130         ServoClose();
131         door = false;
132     }
133     else
134     {
135         lcd.clear();
136         lcd.print(" Wrong Password ");
137         door = false;
138     }
139     delay(1000);
140     lcd.clear();
141     clearData();
142 }
143 }

```

APPLICATIONS

- Convenient for Elderly and Physically Impaired People
- Ensures You a High Security
- It Detects Your Presence
- Send e Keys to Your Near and Dear Ones
- You simply need a smartphone for that

CONCLUSION

Smart home locks definitely offer some perks like security and convenience, but you also need to understand fully the potential issues it comes with before going ahead and installing them.

REFERENCES

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- <https://create.arduino.cc/projecthub/arun8/iot-smart-door-simplest-method-c6c7ca>
- <https://iotdesignpro.com/projects/fingerprint-door-lock-system-using-arduino-and-smartphone>



THANK YOU