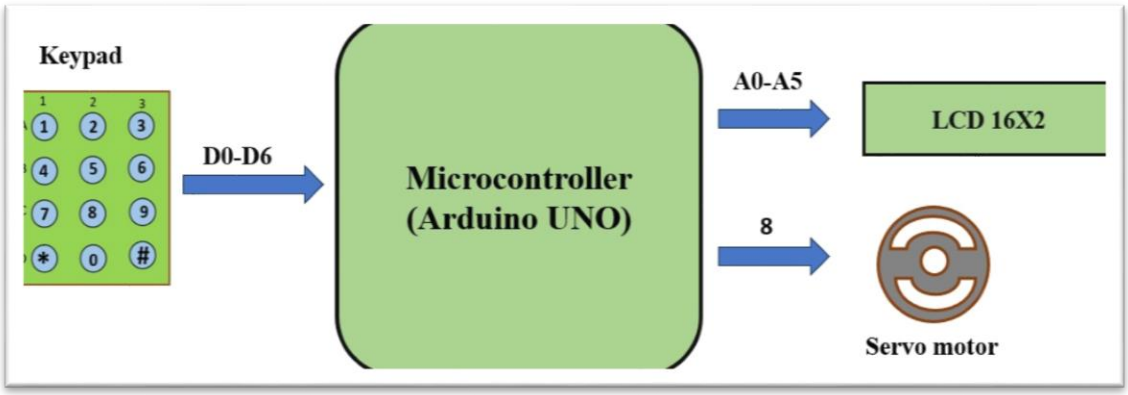
Password based Door Locking System Using Arduino UNO

Description:

An Arduino Based Door Lock System is a project where you can secure your doors with a password. Traditional lock systems which are using mechanical locks are replaced by modern technologies. These techniques are electrical and highly intelligent. These systems are also very efficient than older locks. We can use the door unlocking system as an automated room appliance. Like we open the door and the light and fan of the room turn on. A password-based door locking system using Arduino Uno and an LCD display servo motor is a more advanced version of the simple passwordlock system. It uses a keypad module to enter the password, an LCD display module to show the status, and a servo motor to lock and unlockthe door. The system works by entering the correct password using thekeypad module. If the password is correct, the LCD display will show"Access granted" and the servo motor will rotate to unlock the door for a second before returning to its original position. If the password is incorrect, the LCD display will show "Access denied" for a second before clearing.

Block Diagram:



Input and Output:

S.No	Descrption	Name	Type	Data Direction	Spectification	Remarks
1	4X4 KEYPAD(COLUMNS)	1	INP	DI	Digital	Active High
2	4X4 KEYPAD(COLUMNS)	2	INP	DI	Digital	Active High
3	4X4 KEYPAD(COLUMNS)	3	INP	DI	Digital	Active High
4	4X4 KEYPAD(ROW)	A	INP	DI	Digital	Active High
5	4X4 KEYPAD(ROW)	B	INP	DI	Digital	Active High
6	4X4 KEYPAD(ROW)	C	INP	DI	Digital	Active High
7	4X4 KEYPAD(ROW)	D	INP	DI	Digital	Active High
8	SERVO VCC	VCC	OUT	DO	Digital	Active High
9	SERVO GND	GND	OUT	DO	Digital	Active High
10	SERVO IN	8	OUT	DO	Digital	Active High
11	LCD RST	RS	OUT	DO	Digital	Active High
12	LCD EN	EN	OUT	DO	Digital	Active High
13	LCD DATA PIN	D4	OUT	DO	Digital	Active High
14	LCD DATA PIN	D5	OUT	D0	Digital	Active High
15	LCD DATA PIN	D6	OUT	DO	Digital	Active High
16	LCD DATA PIN	D7	OUT	DO	Digital	Active High

Source Code:

```
#include <LiquidCrystal.h>
#include <Servo.h>
#include <Keypad.h>
Servo myservo;
int pos=0; // position of servo motor
LiquidCrystal lcd(A4, A5, A3, A2, A1, A0);
const byte rows=4;
const byte cols=3;

char key[rows][cols]={
{'1','2','3'},
{'4','5','6'},
{'7','8','9'},
{'*','0','#'}
};
byte rowPins[rows]={0,1,2,3};
byte colPins[cols]={4,5,6};
Keypad keypad= Keypad(makeKeymap(key),rowPins,colPins,rows,cols);
char* password="1112";
int currentposition=0;

void setup()
{

displayscreen();
//Serial.begin(9600);
myservo.attach(8); //Servo motor connection
lcd.begin(16,2);

}

void loop()
{
if( currentposition==0)
{
displayscreen();

}
int l ;
char code=keypad.getKey();
if(code!=NO_KEY)
{
lcd.clear();
lcd.setCursor(0,0);
lcd.print("PASSWORD:");
lcd.setCursor(7,1);
lcd.print(" ");
lcd.setCursor(7,1);
for(l=0;l<=currentposition;++l)
{
```

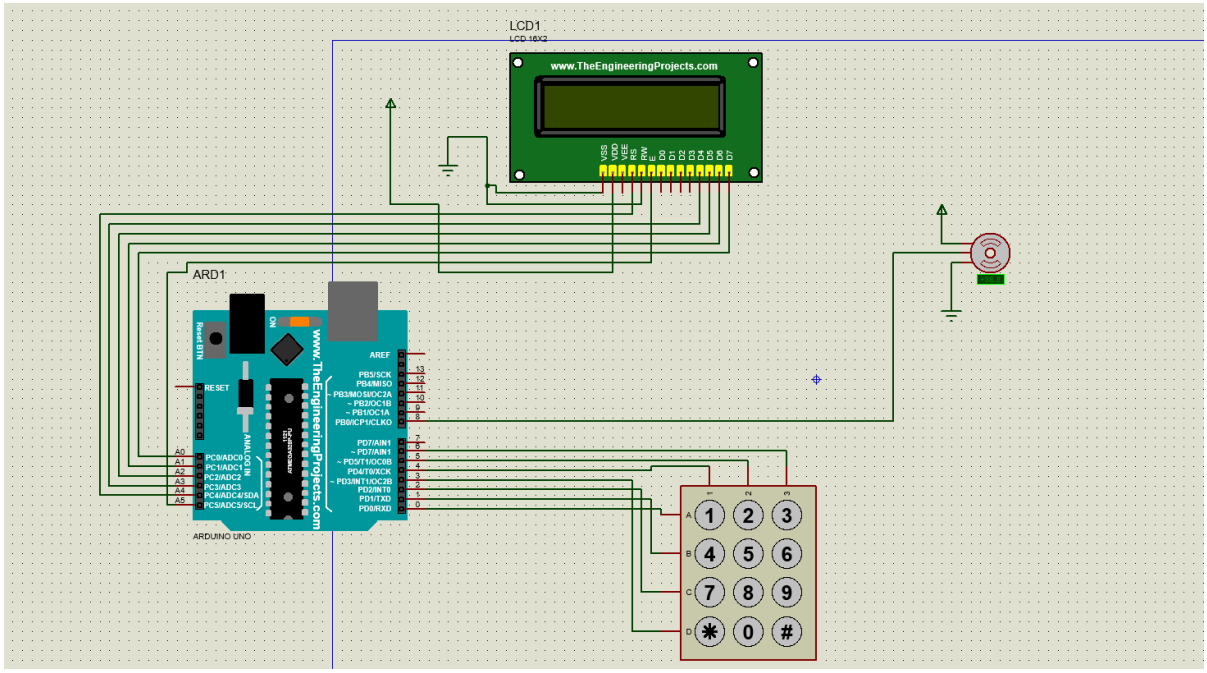
```
lcd.print("*");
//keypress();
}

if (code==password[currentposition])
{
++currentposition;
if(currentposition==4)
{

unlockdoor();
currentposition=0;

}

}


else
{
incorrect();
currentposition=0;

}
}
}

//------------------ Function 1- OPEN THE DOOR----------//

void unlockdoor()
{
delay(900);

lcd.setCursor(0,0);
lcd.println(" ");
lcd.setCursor(1,0);
lcd.print("AZRA FATHIMA");
lcd.setCursor(4,1);
lcd.println("WELCOME!!");
lcd.setCursor(15,1);
lcd.println(" ");
lcd.setCursor(16,1);
lcd.println(" ");
lcd.setCursor(14,1);
lcd.println(" ");
lcd.setCursor(13,1);
lcd.println(" ");

for(pos = 180; pos>=0; pos-=5) // open the door
{
myservo.write(pos);
delay(5);
```

```
}

 delay(1000);
counterbeep();

delay(1000);

for(pos = 0; pos <= 180; pos +=5) // close the door
{ // in steps of 1 degree
myservo.write(pos);
delay(15);
}

currentposition=0;

lcd.clear();
displayscreen();
}

//--------------------Function 2- Wrong code--------------//

void incorrect()
{
delay(500);
lcd.clear();
lcd.setCursor(1,0);
lcd.print("CODE");
lcd.setCursor(6,0);
lcd.print("INCORRECT");
lcd.setCursor(15,1);
lcd.println(" ");
lcd.setCursor(4,1);
lcd.println("TRY AGAIN !!!");

lcd.setCursor(13,1);
lcd.println(" ");
Serial.println("CODE INCORRECT YOU ARE UNAUTHORIZED");
delay(1000);
delay(3000);
lcd.clear();
displayscreen();
}
//-------Function 3 - CLEAR THE SCREEN--------------------/
void clearscreen()
{
lcd.setCursor(0,0);
lcd.println(" ");
lcd.setCursor(0,1);
lcd.println(" ");
lcd.setCursor(0,2);
lcd.println(" ");
lcd.setCursor(0,3);
lcd.println(" ");
```

```
}

//------------Function 4 - DISPLAY FUNCTION--------------------//
void displayscreen()
{

lcd.setCursor(0,0);
lcd.println("ENTER THE CODE");
lcd.setCursor(1 ,1);

lcd.println("TO OPEN DOOR!!");
}



//--------------Function 5 - Count down------------------//
void counterbeep()
{
delay(1200);


lcd.clear();

lcd.setCursor(2,15);
lcd.println(" ");
lcd.setCursor(2,14);
lcd.println(" ");
lcd.setCursor(2,0);
delay(200);
lcd.println("GET IN WITHIN:::");

lcd.setCursor(4,1);
lcd.print("5");
delay(200);
lcd.clear();
lcd.setCursor(2,0);
lcd.println("GET IN WITHIN:");
delay(1000);
lcd.setCursor(2,0);
lcd.println("GET IN WITHIN:");
lcd.setCursor(4,1); //2
lcd.print("4");
delay(100);
lcd.clear();
lcd.setCursor(2,0);
lcd.println("GET IN WITHIN:");
delay(1000);

lcd.setCursor(2,0);
lcd.println("GET IN WITHIN:");
lcd.setCursor(4,1);
lcd.print("3");
delay(100);
```

```
 lcd.clear();
 lcd.setCursor(2,0);
 lcd.println("GET IN WITHIN:");
 delay(1000);

 lcd.setCursor(2,0);
 lcd.println("GET IN WITHIN:");
 lcd.setCursor(4,1);
 lcd.print("2");
 delay(100);
 lcd.clear();
 lcd.setCursor(2,0);
 lcd.println("GET IN WITHIN:");
 delay(1000);

 lcd.setCursor(4,1);
 lcd.print("1");
 delay(100);
 lcd.clear();
 lcd.setCursor(2,0);
 lcd.println("GET IN WITHIN::");

 delay(1000);
 delay(40);
 lcd.clear();
 lcd.setCursor(2,0);
 lcd.print("RE-LOCKING");
 delay(500);
 lcd.setCursor(12,0);
 lcd.print(".");
 delay(500);
 lcd.setCursor(13,0);
 lcd.print(".");
 delay(500);
 lcd.setCursor(14,0);
 lcd.print(".");
 delay(400);
 lcd.clear();
 lcd.setCursor(4,0);
 lcd.print("LOCKED!");
 delay(440);

}
```

Schematic:


LCD1
LCD 16X2
www.TheEngineeringProjects.com
VSS
VDD
VEE
RS
RW
E
D0
D1
D2
D3
D4
D5
D6
D7
ARD1
Reset BTN
ON
RESET
www.TheEngineeringProjects.com
AREF
PB5/SCK
PB4/MISO
~ PB3/MOSI/OC2A
~ PB2/OC1B
~ PB1/OC1A
PB0/ICP1/CLKO
PD7/AIN1
~ PD7/AIN1
~ PD5/T1/OC0B
PD4/T0/XCK
~ PD3/INT1/OC2B
PD2/INT0
PD1/TXD
PD0/RXD
A0
A1
A2
A3
A4
A5
PC0/ADC0
PC1/ADC1
PC2/ADC2
PC3/ADC3
PC4/ADC4/SDA
PC5/ADC5/SCL
ANALOG IN
ATMEGA328P
ARDUINO UNO
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3
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7
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9
*
0
#
A
B
C
D