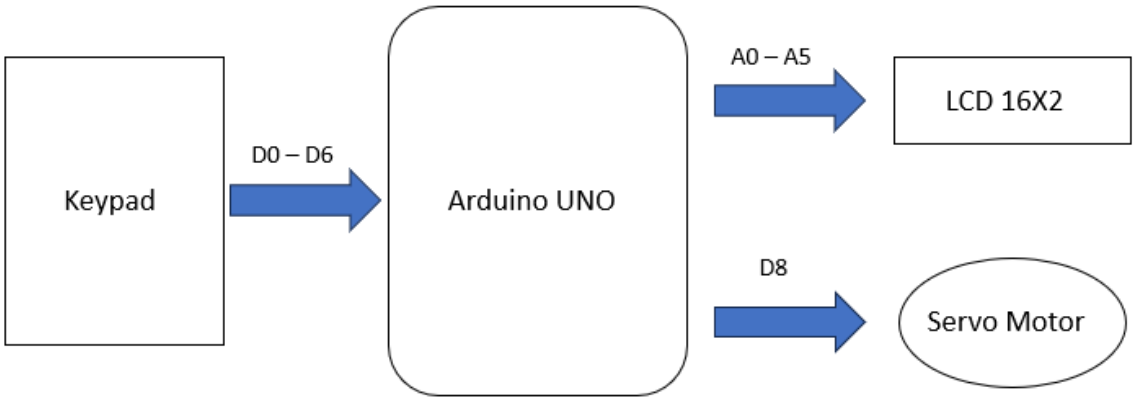
Door Locking System Using Arduino UNO

Description:

In this project, we will be representing the passcode-based door locking system using Arduino UNO, Keypad, LCD 16X2, Servo motor. It uses a keypad module to enter the passcode, an LCD to display the status and a servo motor to indicate the locking and unlocking the door. For the correct passcode the door is unlocked, and the LCD displays as “Access granted” and to indicate that the servo motor rotors and after few seconds the starts to re-locking. If the passcode is wrong, the motor does not rotor and the LCD displays as “Access denied”.

Block Diagram:



Input and Output:

Sl.No	Description	Name	Type	Data Direction	Specification	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="00000";
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;

}
}
}

void unlockdoor()
{
delay(900);

lcd.setCursor(0,0);
lcd.println(" ");
lcd.setCursor(1,0);
lcd.print("JAISANJU");
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)
{
myservo.write(pos);
delay(5);
}

 delay(1000);
counterbeep();

delay(1000);

for(pos = 0; pos <= 180; pos +=5)
{
```

```
myservo.write(pos);
delay(15);
}

currentposition=0;

lcd.clear();
displayscreen();
}


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();
}
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(" ");
}

void displayscreen()
{

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

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



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: