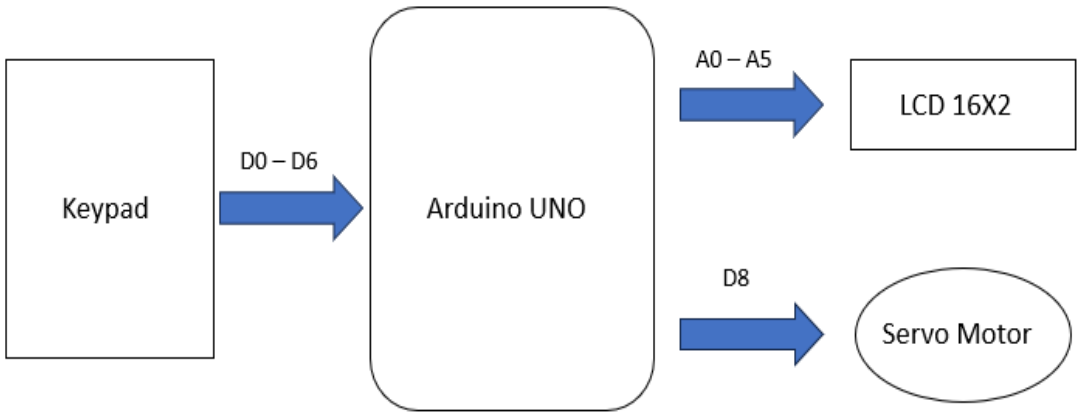
PROJECT 3

PASSWORD BASED LOCKING SYSTEM USING ARDUINO UNO

➢ INTRODUCTION:

A door lock system using an Arduino Uno is a practical and versatile electronic project that combines hardware and software to create a secure and automated means of controlling access to a door or entry point. This system replaces traditional mechanical locks with an electronic solution that can be controlled remotely, offer enhanced security features, and provide access logs. Here's an introduction to the concept and components of a door lock system using Arduino Uno.

➢ BLOCK DIAGRAM:



➢ MATERIALS REQUIRED:

1. Arduino Uno board.
2. 4x4 Matrix Keypad.
3. Servo motor (or any other locking mechanism).
4. Jumper wires.
5. Breadboard (optional).

➢ PROJECT OVERVIEW:

- **Arduino Uno:** The Arduino Uno serves as the central control unit of the project. It processes user input, manages the locking mechanism, and controls the system's behavior.
- **4x4 Matrix Keypad:** The keypad allows users to input the password. It consists of a grid of buttons, each representing a digit (0-9) or a special character (e.g., "*", "#").
- **Servo Motor:** The servo motor acts as the locking mechanism for the door. It can be rotated to lock or unlock the door, providing physical security.

➢ APPLICATIONS:

- **Home Security:** The system can be used to secure home entry points such as main doors or gates.
- **Office Access Control:** Offices and businesses can use this system to control access to restricted areas.
- **Garage Door Lock:** It can be implemented to control garage door access for added convenience and security.

- **Locker or Cabinet Lock:** Smaller versions of this system can be used to secure lockers or cabinets.

➢ PROGRAM:

```
#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;

}
}
```

```
}

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

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) // 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 DIAGRAM: