END SEMESTER ASSESSMENT (ESA)
B.TECH. (CSE)
IV SEMESTER

UE18CS256 – MICROPROCESSOR AND COMPUTER ARCHITECTURE LABORATORY

MINI PROJECT REPORT

ON

PASSWORD PROTECTED DOOR LOCK SYSTEM

SUBMITTED BY

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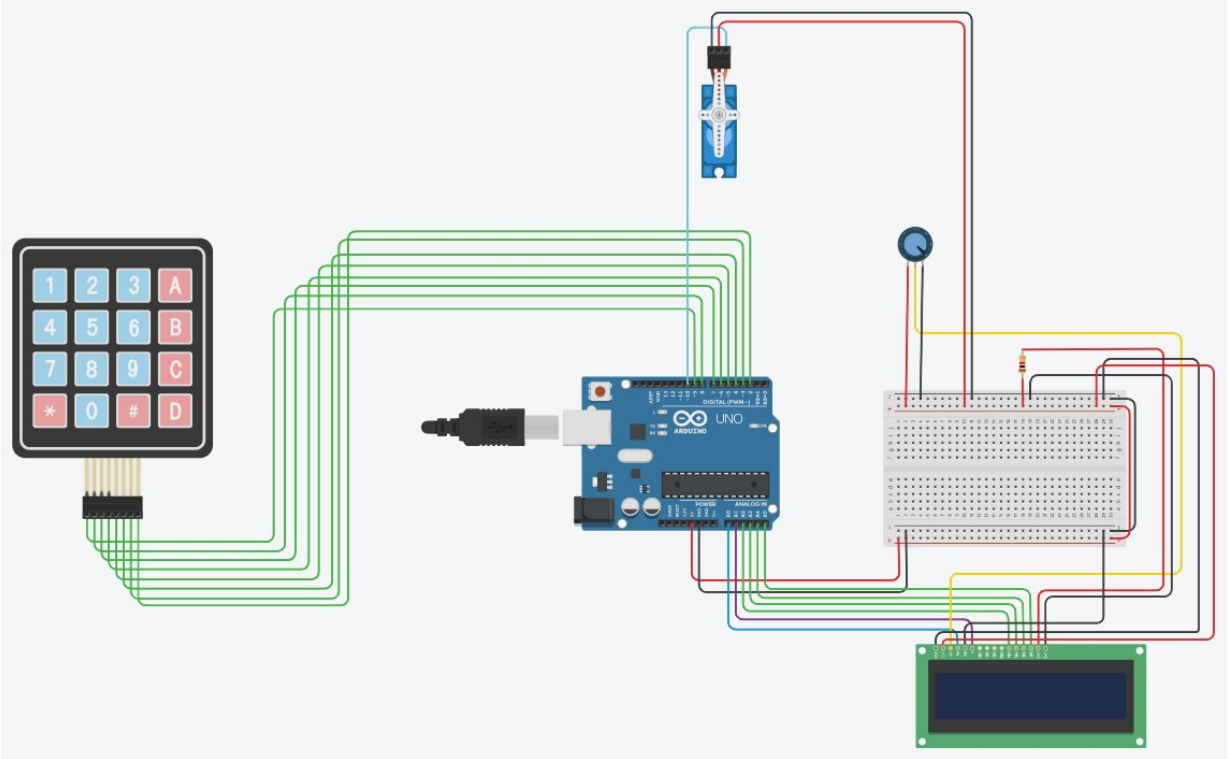
ABSTRACT OF THE PROJECT:

In this project we have designed Password Protected Door Lock System Using Arduino & Keypad. As thefts are increasing day by day security is becoming a major concern nowadays. So a digital code lock can secure our home or locker easily. It will open our door only when the right password is entered.

Circuit of this project is very simple which contains Arduino, keypad module, Servo Motor,Potentiometer,resistor and LCD. Arduino controls the complete processes like taking a password form the keypad module, comparing passwords,rotating servo motor, and sending status to the LCD display. The keypad is used for taking the password. Servo motor is used for opening the gate while rotating and LCD is used for displaying status or messages on it.

Figure1:CIRCUIT DIAGRAM



In our circuit diagram we have used a 4x4 keypad which has 4 rows and 4 columns.Each button in row are connected with one another .Similarly each button in column are also connected.

Next we have used a 16x2 LCD display which can display 2 lines each of which can contain 16 characters.

We have used a Servo motor which changes its angle depending on the pulse width.

We have also used a Potentiometer which is used to control the contrast of LCD display.

Finally we have used a resistor to limit the amount of current flowing to the LCD Display.

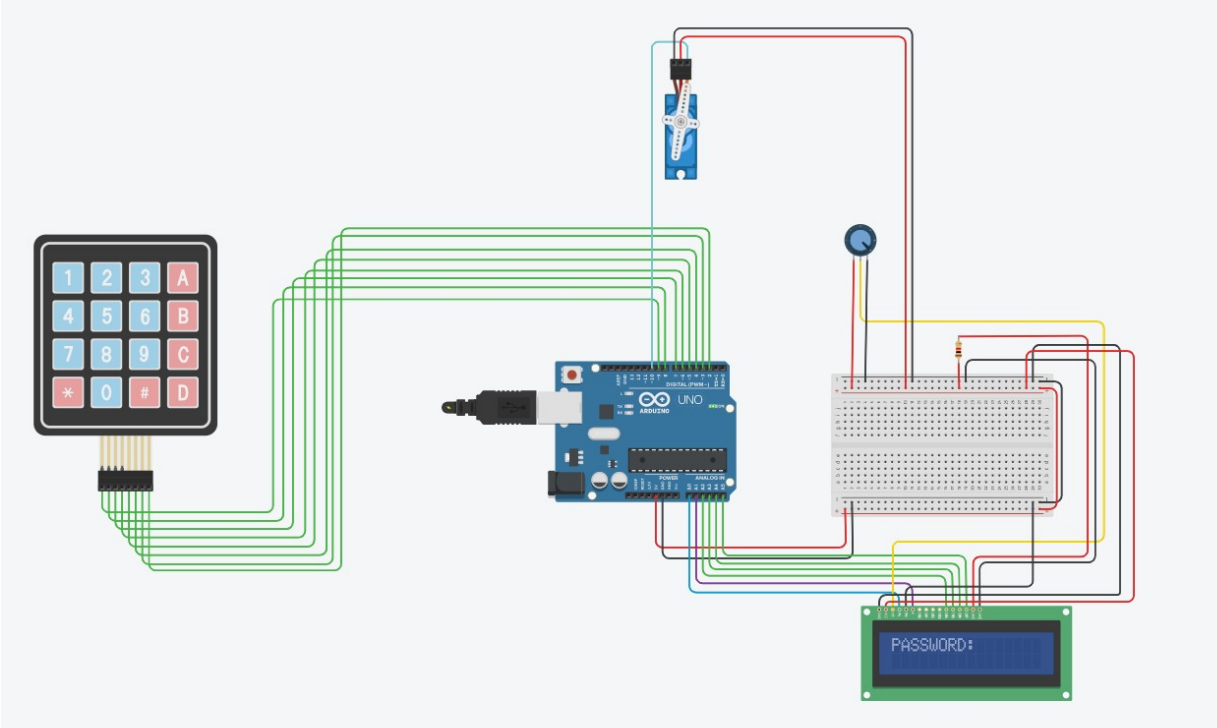
ARDUINO CODE:

```
#include <Servo.h>
#include <Keypad.h>
#include <LiquidCrystal.h>

LiquidCrystal lcd(A0,A1,A2,A3,A4,A5);
int const rows= 4;
int const cols= 4;
char keys[rows][cols]= {
{'1', '2', '3', 'A'},
{'4', '5', '6', 'B'},
{'7', '8', '9', 'C'},
{'*', '0', '#', 'D'}};
byte rowPins[rows] = {9,8,7,6};
byte colPins[cols]= {5,4,3,2};
Keypad keypad = Keypad(makeKeymap(keys),rowPins,colPins,rows,cols);
String password="1379";
String pressed="";
Servo servo1;

void setup()
{
  Serial.begin(9600);
  lcd.begin (16,2);
  servo1.attach(10);
  initializeLcd();
}

void loop()
{
  char key=keypad.getKey();
  if (int(key) !=0)
  {
    if (key=='D')
    {
      reset();
      initializeLcd();
    }
    else if(key=='*')
    {
      checkPassword();
    }
    else if(key=='#')
    {
      lockDoor();
    }
    else
    {
```

```
      pressed.concat(key);
      lcd.print("*");
      Serial.print(key);
    }
  }
}

void initializeLcd()
{
  lcd.clear();
  lcd.print("PASSWORD:");
  lcd.setCursor(1,1);
  servo1.write(180);
}
void checkPassword()
{
  if(pressed==password)
  {
    lcd.clear();
    lcd.setCursor(0,0);
    lcd.print("Access Granted!");
    servo1.write(90);
  }
  else
  {
    lcd.clear();
    lcd.setCursor(0,0);
    lcd.print("Access denied!");
    servo1.write(180);
  }
}

void lockDoor()
{
  lcd.clear();
  lcd.setCursor(0,0);
  lcd.print("Door Locked");
  servo1.write(180);
}

void reset()
{
  pressed="";
  lcd.clear();
  lcd.setCursor(0,0);
  lcd.print("Resetting...");
  delay(500);
}
```

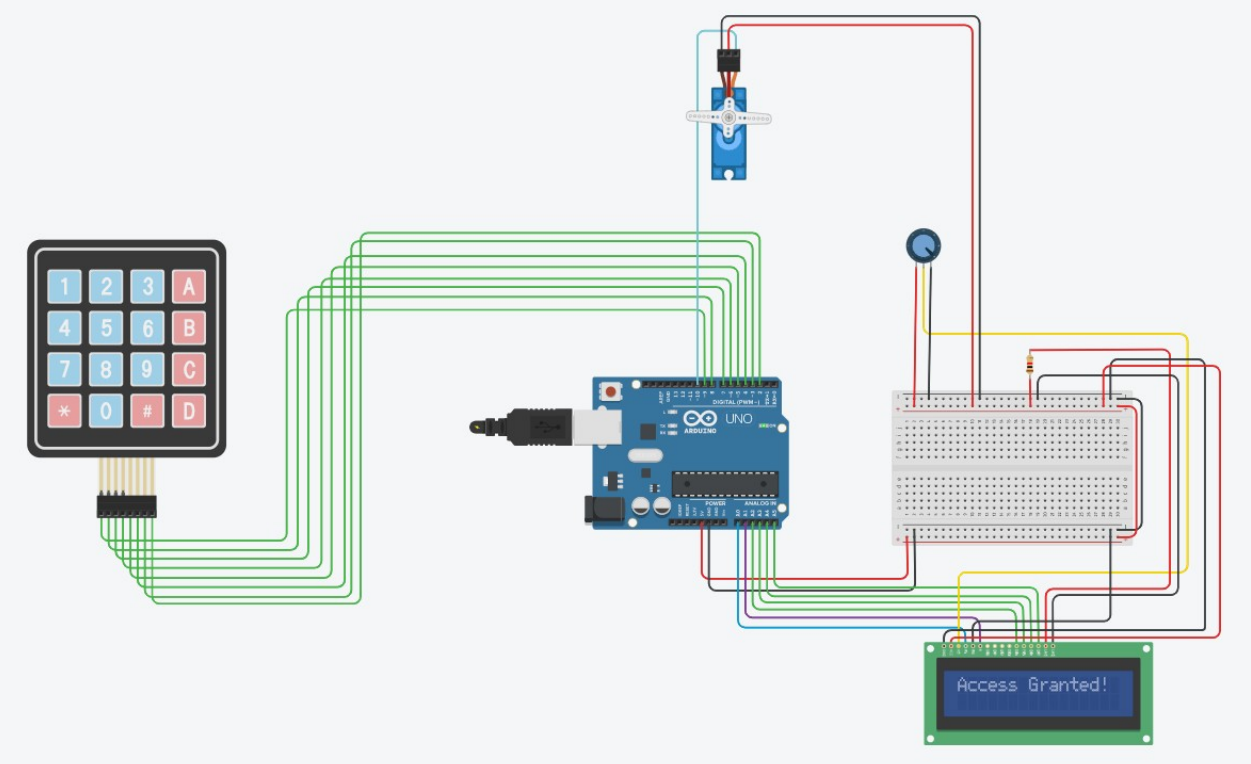
SCREEN SHOTS OF THE OUTPUT:

Figure 2:Initial screen when we start simulation



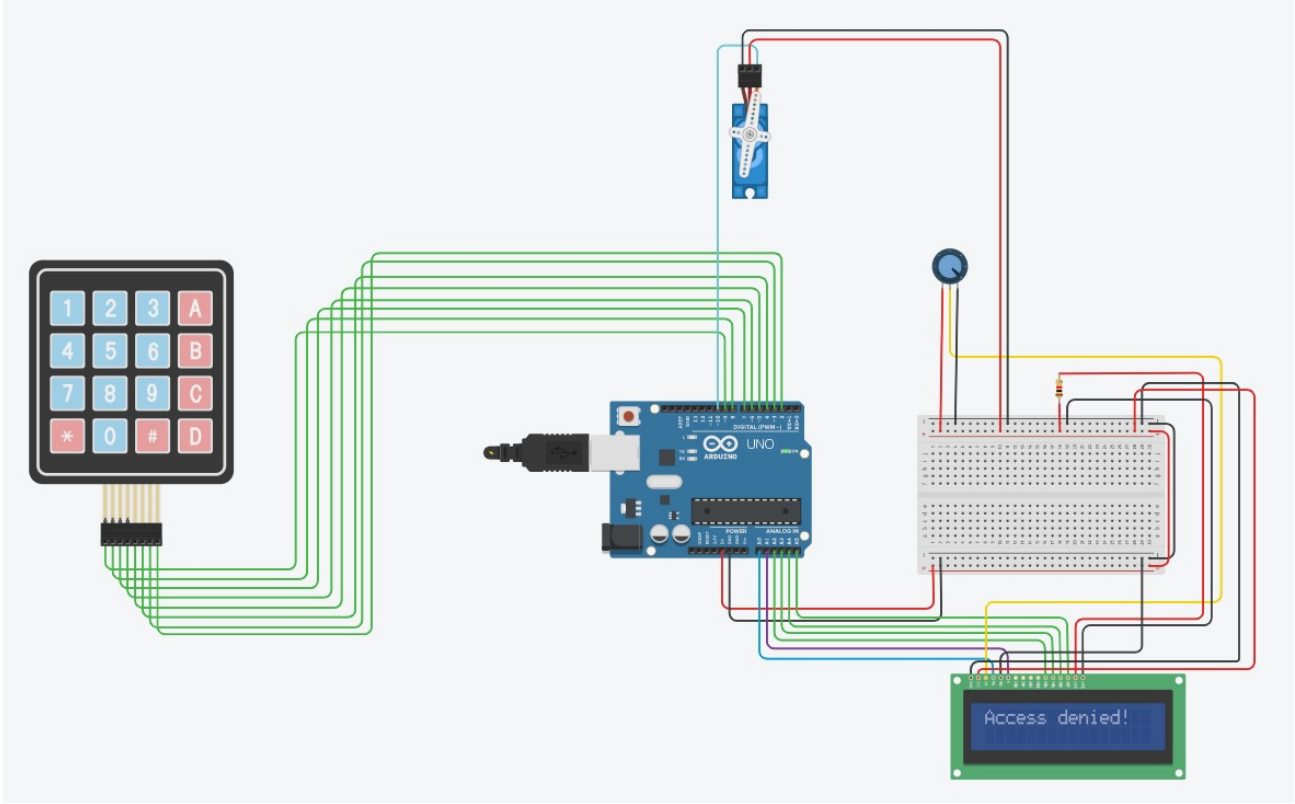
This is the initial screen that we see when we start simulation.We see that servo motor is at 180 degree(ie door is closed) and the LCD display is asking for password.

Figure 3:Access Granted



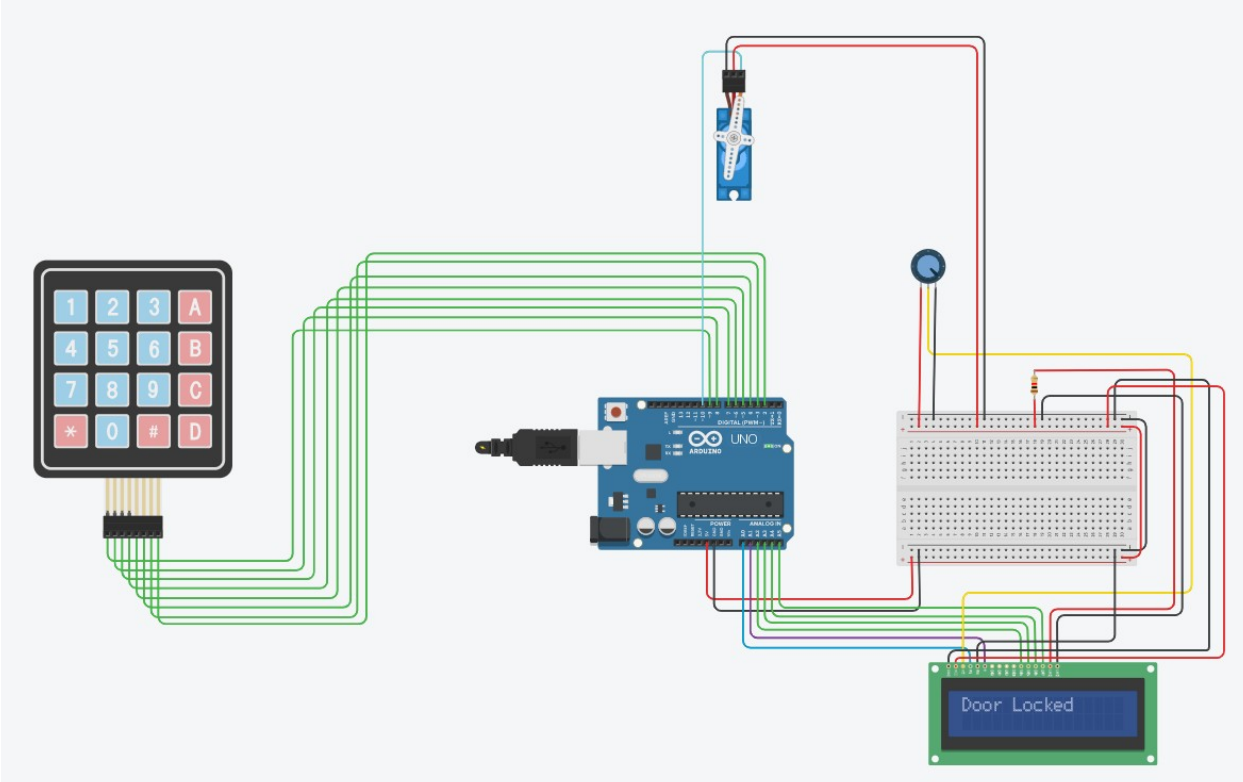
When we enter correct password in keypad,servo motor rotates by 90 degree(ie door is open) and “Access Granted” is displayed on LCD display.

Figure 4:Access Denied



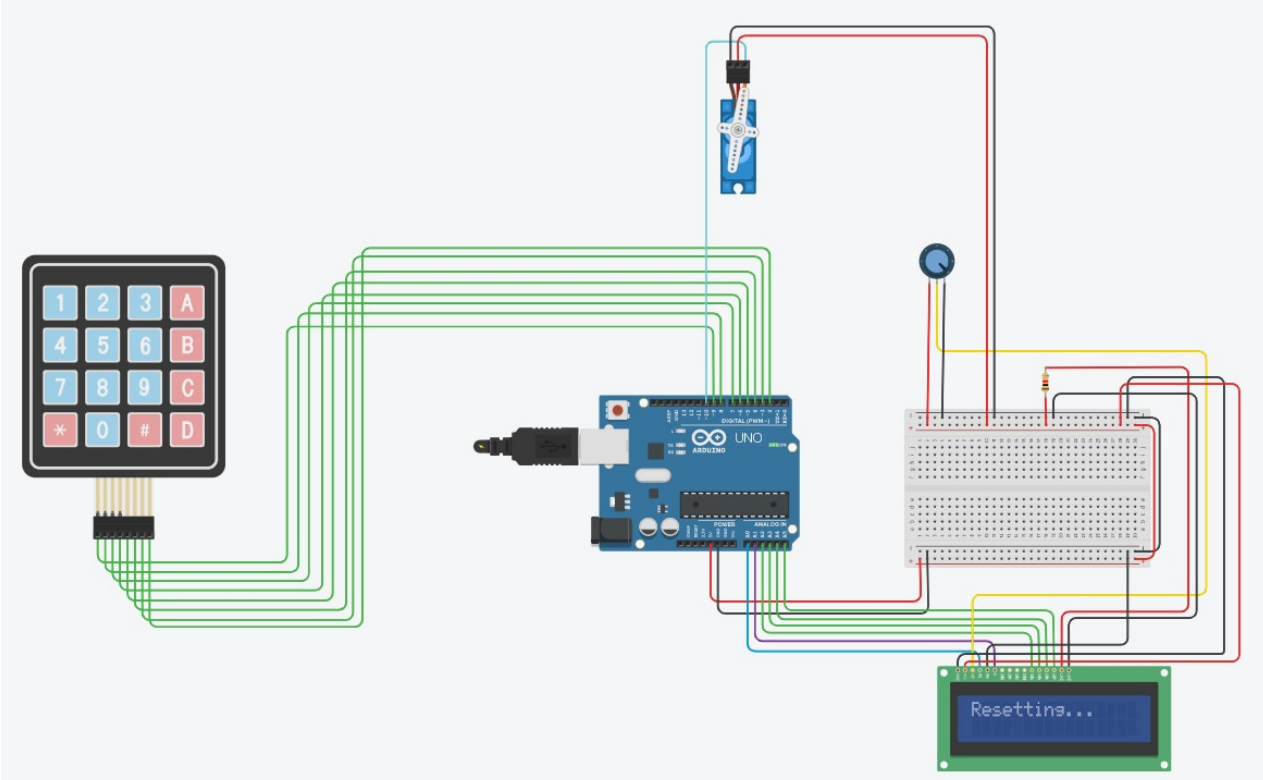
If we enter wrong password in keypad,servo motor rotates by 180 degree(ie door is closed) and “Access Denied” is displayed on LCD display.

Figure 5:Door Locked



If we press “#” symbol,door is locked(ie servo motor is at 180 degrees) and “Door Locked” is displayed on LCD screen

Figure 6:Resetting



If we press “D” symbol,reset is performed

Firstly door is locked(ie servo motor is at 180 degrees) and “Resetting….” is displayed on LCD screen.

At last it goes back to the initial screen that was displayed at the start of the simulation.

REFERENCES

1)https://en.wikipedia.org/wiki/Arduino_Uno#:~:text=The%20Arduino%20Uno%20is%20an,and%20developed%20by%20Arduino.cc.&text=The%20board%20has%2014%20digital,a%20type%20B%20USB%20cable.

2)https://www.circuitbasics.com/how-to-set-up-a-keypad-on-an-arduino/

3)https://www.tutorialspoint.com/arduino/arduino_servo_motor.htm#:~:text=Advertisements,angular%20position%20of%20the%20shaft.

4)https://www.circuitbasics.com/how-to-set-up-an-lcd-display-on-an-arduino/