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Lab Report on

Home Security System

Course Code: CSE 426

Course Title: IoT Lab

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Date of Submission: 07 November, 2021

Lab report no: 2

Introduction:

In this lab task, we had to make a home security system. To execute this task in proteus we had to install Keypad Library and IR sensor Library.

IR sensor detects when someone enters the area. When an intruder is detected, it activates the buzzer. Our body generates heat energy in the form of infrared which is invisible to human eyes. But it can be detected by an electronic sensor. This type of sensor is made up of crystalline material that is Pyroelectric. We used IR Sensor as an infrared sensor that generates an electric charge when exposed in heat and sends a signal to Arduino. Other than this we used a 3 x 4 Keypad to take a password as an input. The system will be frozen if someone gave an invalid password more than three times. And the buzzer will sound than.

Tools/ Component Required:

1. IR Sensor
2. Keypad
3. LCD
4. Buzzer
5. Servo Motor

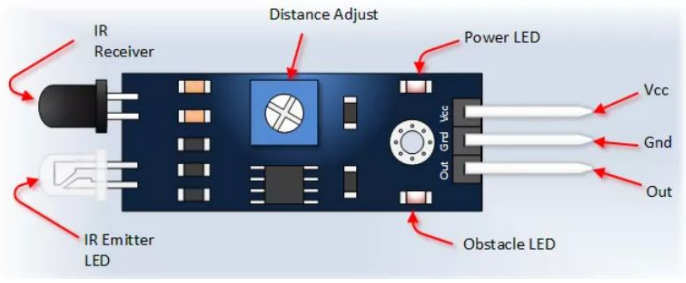

Figure: IR Sensor

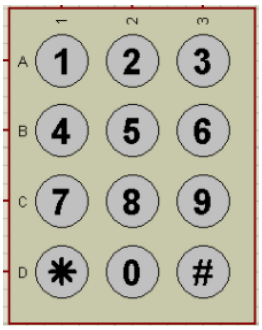

Figure: 3x4 Keypad

Circuit diagram:

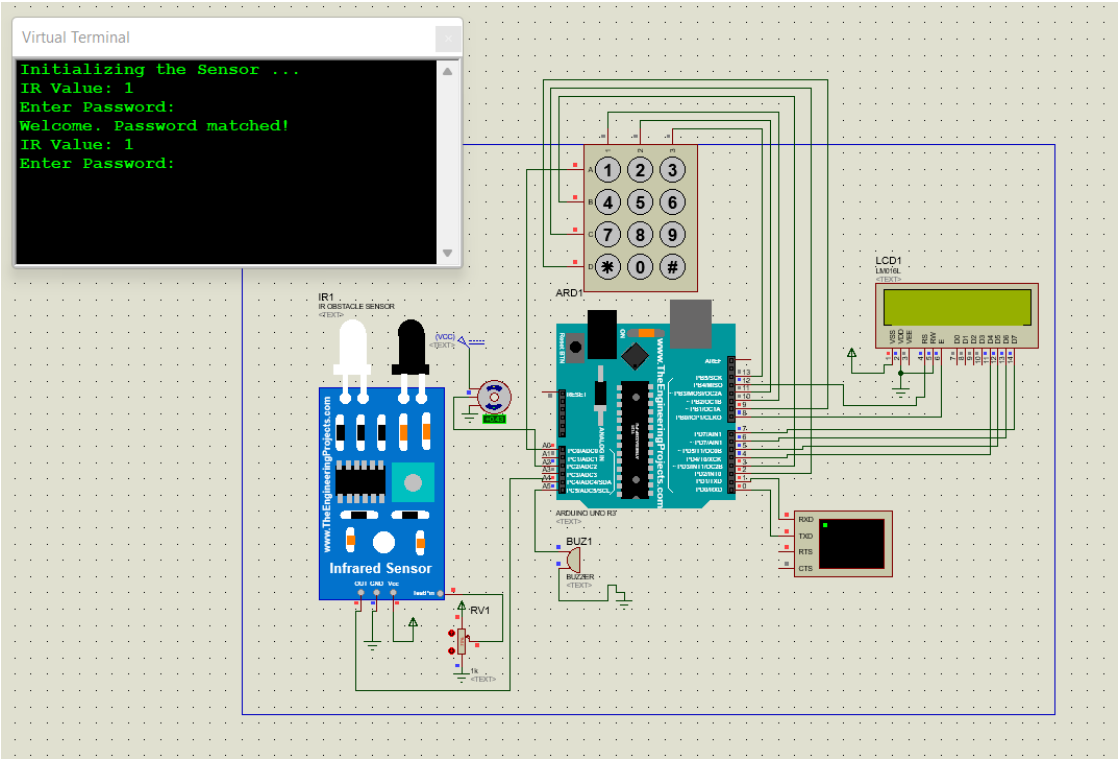

Figure: Circuit diagram of home security system

Code:

```
#include <LiquidCrystal.h>
#include <Keypad.h>
#include <Servo.h>
Servo ms;
#define RS 12
#define E 8
#define ROW_NUM 4
#define COL_NUM 3
#define BUZZER A5
```

```
LiquidCrystal lcd(RS, E, 4, 5, 6, 7);
char keys[ROW_NUM][COL_NUM] ={
  {'1', '2', '3'},
  {'4', '5', '6'},
  {'7', '8', '9'},
  {'*', '0', '#'} };

byte pin_rows[ROW_NUM] = {A0, 3, 2, 9};
byte pin_column[COL_NUM] = {10, 11, 13};
Keypad keypad = Keypad(makeKeymap(keys), pin_rows, pin_column, ROW_NUM,
COL_NUM);

void setup() {
pinMode(4, OUTPUT);
pinMode(5, OUTPUT);
pinMode(6, OUTPUT);
pinMode(7, OUTPUT);
pinMode(8, OUTPUT);
pinMode(RS, OUTPUT);

pinMode(10, INPUT);
pinMode(11, INPUT);
pinMode(12, INPUT);
pinMode(31, INPUT);
pinMode(9, INPUT);
pinMode(3, INPUT);
pinMode(2, INPUT);
Serial.begin(9600);
Serial.println("Initializing the Sensor ...");
```

```
lcd.begin(16, 2);
lcd.setCursor(0, 0);
lcd.print("CSE");
lcd.setCursor(0, 1);
lcd.print("39/1");
lcd.clear();
ms.attach(A2);}
void loop() {
int tried = 3;
char pass[4] = {'1', '2', '3', '4'};
here:
int COUNTER = 4;
bool alarm = false;
lcd.clear();
lcd.setCursor(0, 1);
int ir = digitalRead(A4);
Serial.print("IR Value: ");
Serial.println(ir);

Serial.println ("Enter Password: ");
char tmpPass[4];
char key;
int i = 0;
do{
key = keypad.getKey();
if(key){
tmpPass[i++] = key;
COUNTER--; }}
while(COUNTER > 0);
```

```
if(pass[0] == tmpPass[0] && pass[1] == tmpPass[1] && pass[2] == tmpPass[2] && pass[3] == tmpPass[3]){
Serial.println("Welcome. Password matched!");
ms.write(180); //  90 degree
delay(1000);
ms.write(93); // servo motor }
else{
Serial.println("Password not matched!");
Serial.print("You have ");
tried--;
Serial.print(tried);
Serial.println(" tries left!");
if(!tried){
tried = 3;
Serial.println("Freezed for 5 minutes!");
digitalWrite(BUZZER, HIGH); }
delay(1000);
digitalWrite(BUZZER, LOW);}
goto here;}
```

Conclusion:

In lab class six we got to know about the use of Servo motor, Keypad and that knowledge helped us to do this lab task. This lab task helped us to understand and gain more knowledge on Keypad, IR sensor, etc. Hence, it is teamwork so we worked as a team to complete this lab task. We did face some problems during doing this task and we find the solutions from different websites and Youtube tutorials. In the end, we have successfully found the output as we wanted.