

ASSIGNMENT-1 SMART HOME BUILDING

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Screenshot of the Tinkercad interface showing a circuit design for a Smart Home system.

The circuit diagram includes the following components and connections:

- An Arduino Uno R3 microcontroller connected to various pins and sensors.
- A PIR motion sensor connected to pin 10.
- A LDR sensor connected to pin A0.
- A Gas Sensor connected to pin A1.
- A relay module connected to pin 12.
- A piezo buzzer connected to pin 8.
- A PNP transistor (npn) connected to pin 10 as a switch.
- A red LED connected to pin 4.
- A light bulb connected to pin 13.
- A 12V power source and a 0.00A ammeter.
- Ultrasonic distance sensors connected to pins 7 and 8.

The code editor shows the following C++ code for the Arduino Uno R3:

```

1 #include <Servo.h>
2
3 int output1Value = 0;
4 int sen1Value = 0;
5 int sen2Value = 0;
6 int const gas_sensor = A1;
7 int const LDR = A0;
8 int limit = 400;
9
10 long readUltrasonicDistance(int triggerPin, int echoPin)
11 {
12     pinMode(triggerPin, OUTPUT); // Clear the trigger
13     digitalWrite(triggerPin, LOW);
14     delayMicroseconds(2);
15     // Sets the trigger pin to HIGH state for 10 microseconds
16     digitalWrite(triggerPin, HIGH);
17     delayMicroseconds(10);
18     digitalWrite(triggerPin, LOW);
19     pinMode(echoPin, INPUT);
20     // Reads the echo pin, and returns the sound wave travel time
21     return pulseIn(echoPin, HIGH);
22 }
23
24 Servo servo_7;
25
26 void setup()
27 {
28     Serial.begin(9600); //initialize serial communication
29     pinMode(A0, INPUT); //LDR
30     pinMode(A1, INPUT); //gas sensor
31     pinMode(12, OUTPUT); //connected to relay
32     servo_7.attach(7, 500, 2500); //servo motor
33
34     pinMode(8,OUTPUT); //signal to piezo buzzer
35     pinMode(9, INPUT); //signal to PIR
36     pinMode(10, OUTPUT); //signal to npn as switch
37     pinMode(4, OUTPUT); //Red LED
38 }
```

The serial monitor window is visible at the bottom right.

CODE:

```
#include <LiquidCrystal.h>
LiquidCrystal lcd(12, 13, 11, 10, 9, 8);
int pirPin=7;
int pirInput=0;
int bulbPin=6;
int photoValue=0;
int tempReading=0,temp1=0,temperature=0;
int fanPin=5;
int gasReading=0;
int greenLed=4;
int yellowLed=3;
int redLed=2;
int piezoPin=0;
void scrollScreenSaver() {

    lcd.clear();
    lcd.setCursor(15, 0);
    lcd.print("Welcome");
    lcd.setCursor(15, 1);
    lcd.print("to my home");

    for (int positionCounter = 0; positionCounter < 22; positionCounter++) {
        lcd.scrollDisplayLeft();
        delay(50);
    }
}
void setup()
{
    lcd.begin(16, 2);
    lcd.print("hello, world!");
    pinMode(pirPin, INPUT);
    pinMode(bulbPin, OUTPUT);
    pinMode(greenLed,OUTPUT);
    pinMode(yellowLed,OUTPUT);
    pinMode(redLed,OUTPUT);
    pinMode(piezoPin,OUTPUT);

    Serial.begin(9600);
}

void loop()
```

```

{
  lcd.setCursor(0, 1);
  lcd.print(millis() / 1000);
  pirInput=digitalRead(pirPin);
  photoValue=analogRead(A0);
  Serial.println(photoValue);
  tempReading=analogRead(A1);
  temperature=(5000.0/1024.0*tempReading/10.0);
  Serial.println(temperature);

  gasReading=analogRead(A2);
  Serial.println(gasReading);
  Serial.println(".....");
  digitalWrite(greenLed,gasReading>100 ? HIGH : LOW);
  digitalWrite(yellowLed,gasReading>200 ? HIGH : LOW);
  digitalWrite(redLed,gasReading>300 ? HIGH : LOW);

  if(pirInput==HIGH)
  {
    lcd.clear();
    lcd.setCursor(0,0);
    lcd.print("Motion Detected");
    if(photoValue<300)
    {
      digitalWrite(bulbPin,HIGH);
      lcd.setCursor(0,1);
      lcd.print("Light is on");
      delay(1000);
    }
    if(temperature>25)
    {
      digitalWrite(fanPin,HIGH);
      lcd.setCursor(0,1);
      lcd.print("          ");
      lcd.setCursor(0,1);
      lcd.print("Fan is on");
      delay(1000);
    }
  }
  else
  {
    scrollScreenSaver() ;
  }
}

```

```
}

/*digitalWrite(13, HIGH);
delay(1000);
digitalWrite(13, LOW);
delay(1000);
}

Footer
```