

(MADHUSOWNDHARYA M)

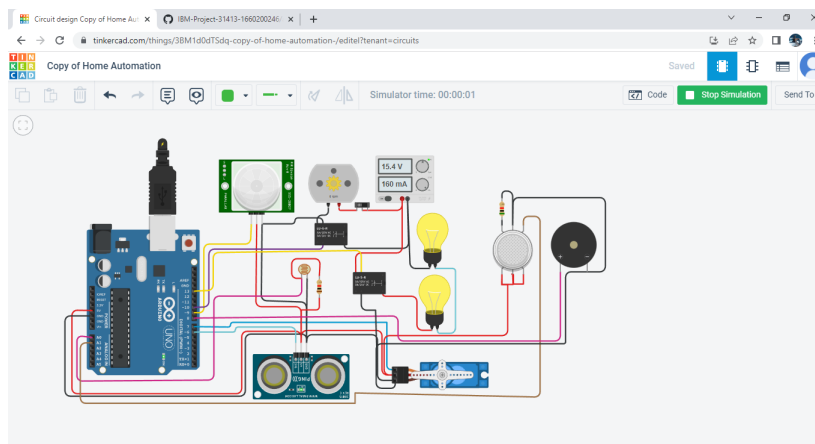
IBM-Assignment 1-Smart Home

Project Title:

Real-Time River Water Quality Monitoring And Control System

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Circuit:



Simulation Code:

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

```
int output1Value = 0;
```

```
int sen1Value = 0;
```

```
int sen2Value = 0;
```

```
int const gas_sensor = A1;
```

```
int const LDR = A0;
```

```
int limit = 400;
```

```
long readUltrasonicDistance(int triggerPin, int echoPin)
```

```
{
```

```
  pinMode(triggerPin, OUTPUT); // Clear the trigger
```

```
  digitalWrite(triggerPin, LOW);
```

```
  delayMicroseconds(2);
```

```

// Sets the trigger pin to HIGH state for 10 microseconds
digitalWrite(triggerPin, HIGH);
delayMicroseconds(10);
digitalWrite(triggerPin, LOW);
pinMode(echoPin, INPUT);
// Reads the echo pin, and returns the sound wave travel time in microseconds
return pulseIn(echoPin, HIGH);
}

```

```

Servo servo_7;

```

```

void setup()
{
  Serial.begin(9600); //initialize serial communication
  pinMode(A0, INPUT);    //LDR
  pinMode(A1, INPUT);    //gas sensor
  pinMode(13, OUTPUT);   //connected to relay
  servo_7.attach(7, 500, 2500); //servo motor

  pinMode(8, OUTPUT);    //signal to piezo buzzer
  pinMode(9, INPUT);    //signal to PIR
  pinMode(10, OUTPUT);   //signal to npn as switch
  pinMode(4, OUTPUT);    //Red LED
  pinMode(3, OUTPUT);    //Green LED
}

```

```

void loop()
{
  //-----light intensity control-----//
  int val1 = analogRead(LDR);
  if (val1 > 500)
  {
    digitalWrite(13, LOW);
    Serial.print("Bulb ON = ");
    Serial.print(val1);
  }
  else
  {
    digitalWrite(13, HIGH);
    Serial.print("Bulb OFF = ");
    Serial.print(val1);
  }
  //----- light & fan control -----//
}

```

```

sen2Value = digitalRead(9);
if (sen2Value == 0)
{
    digitalWrite(10, LOW); //npn as switch OFF
    digitalWrite(4, HIGH); // Red LED ON, indicating no motion
    digitalWrite(3, LOW); //Green LED OFF, since no Motion detected
    Serial.print("    || NO Motion Detected    ");
}

if (sen2Value == 1)
{
    digitalWrite(10, HIGH); //npn as switch ON
    delay(5000);
    digitalWrite(4, LOW); // RED LED OFF
    digitalWrite(3, HIGH); //GREEN LED ON, indicating motion detected
    Serial.print("    || Motion Detected!    ");
}
// ----- Gas Sensor -----//
int val = analogRead(gas_sensor); //read sensor value
Serial.print("|| Gas Sensor Value = ");
Serial.print(val); //Printing in serial monitor
//val = map(val, 300, 750, 0, 100);
if (val > limit)
{
    tone(8, 650);
}
    delay(300);
    noTone(8);

//----- servo motor -----//
sen1Value = 0.01723 * readUltrasonicDistance(6, 6);

if (sen1Value < 100)
{
    servo_7.write(90);
    Serial.print(" || Door Open! ; Distance = ");
    Serial.print(sen1Value);
    Serial.print("\n");
}
else
{
    servo_7.write(0);
}

```

```
    Serial.print(" || Door Closed! ; Distance = ");  
    Serial.print(sen1Value);  
    Serial.print("\n");  
}  
delay(10); // Delay a little bit to improve simulation performance  
}
```