ASSIGNMENT 1

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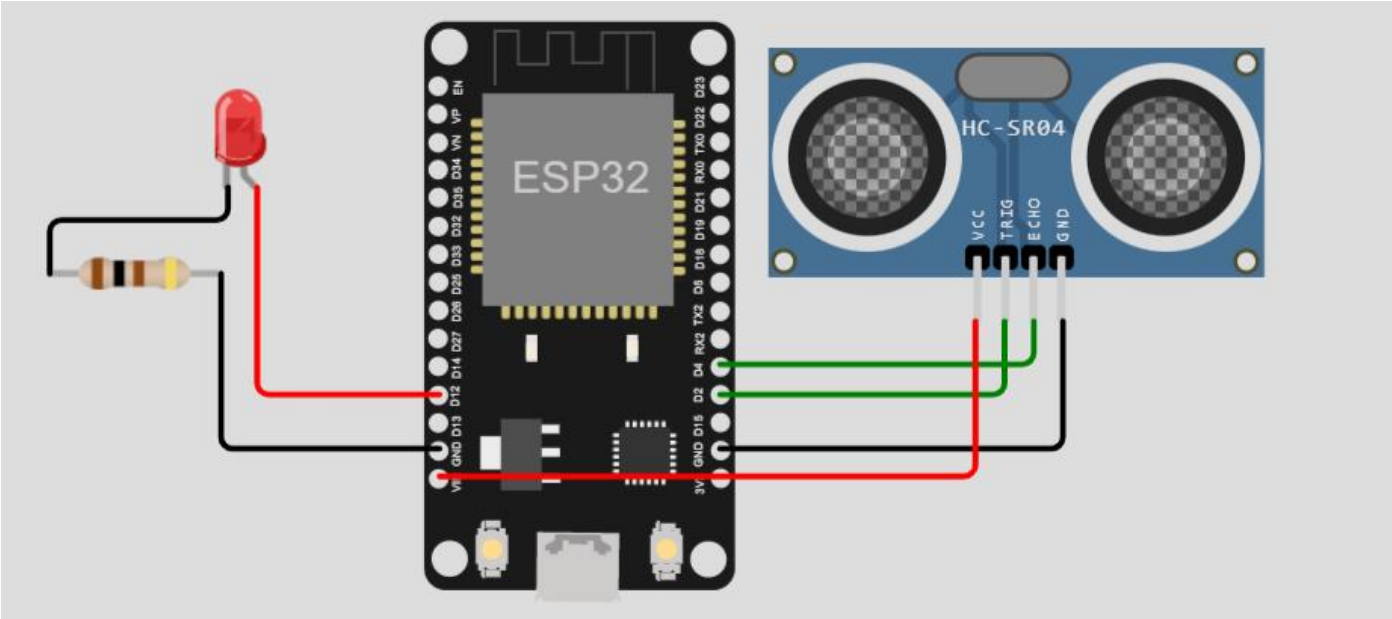
ULTRASONIC SENSOR CIRCUIT USING WOKWI

Aim: To construct a circuit with Ultrasonic sensor in WOKWI such that if distance is less than 100 cm, the led must glow.

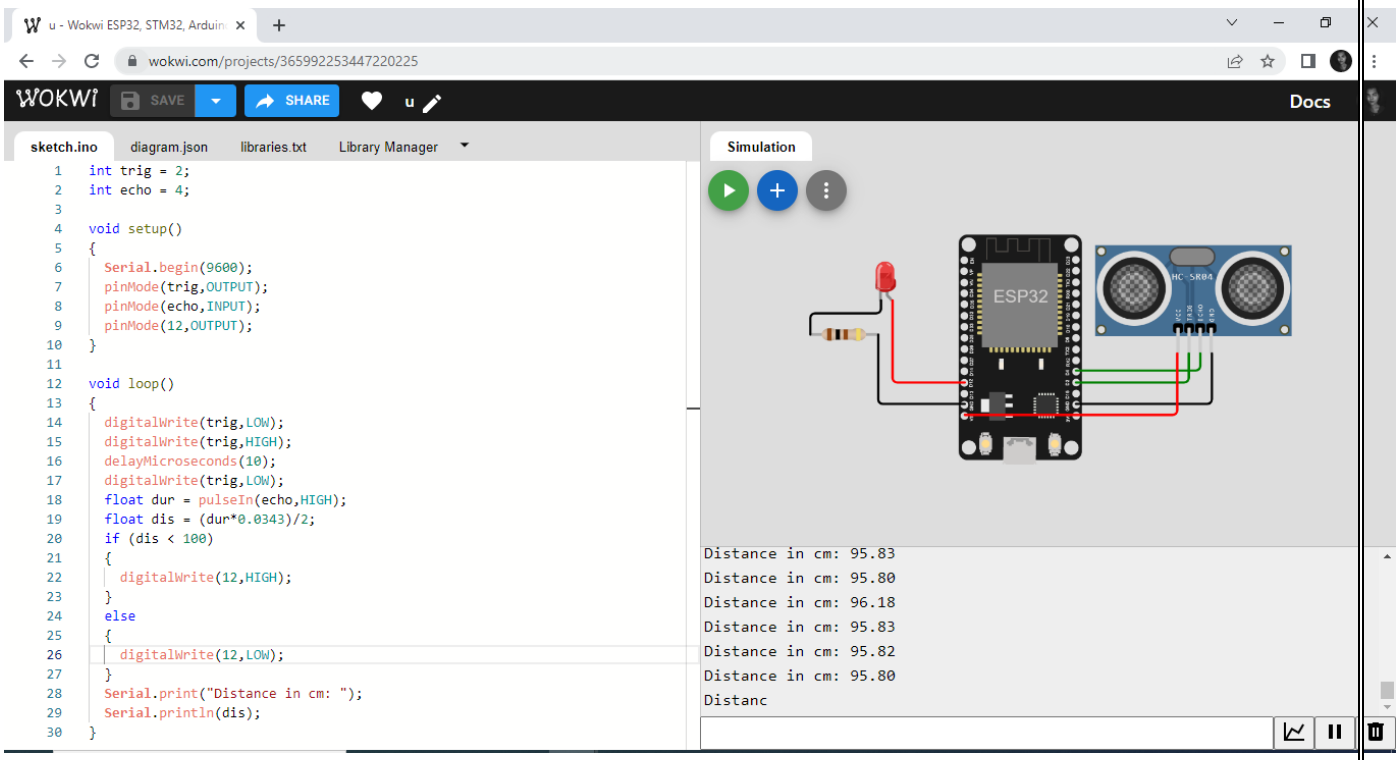
Software required: WOKWI

Components Required: ESP32, 100 ohm Resistor, Ultrasonic sensor, LED, Connecting wires

Circuit Diagram:



Simulation:




```
int trig = 2;
int echo = 4;

void setup()
{
  Serial.begin(9600);
  pinMode(trig,OUTPUT);
  pinMode(echo,INPUT);
  pinMode(12,OUTPUT);
}

void loop()
{
  digitalWrite(trig,LOW);
  digitalWrite(trig,HIGH);
  delayMicroseconds(10);
  digitalWrite(trig,LOW);
  float dur = pulseIn(echo,HIGH);
  float dis = (dur*0.0343)/2;
  if (dis < 100)
  {
    digitalWrite(12,HIGH);
  }
  else
  {
    digitalWrite(12,LOW);
  }
  Serial.print("Distance in cm: ");
  Serial.println(dis);
}
```

Procedure:

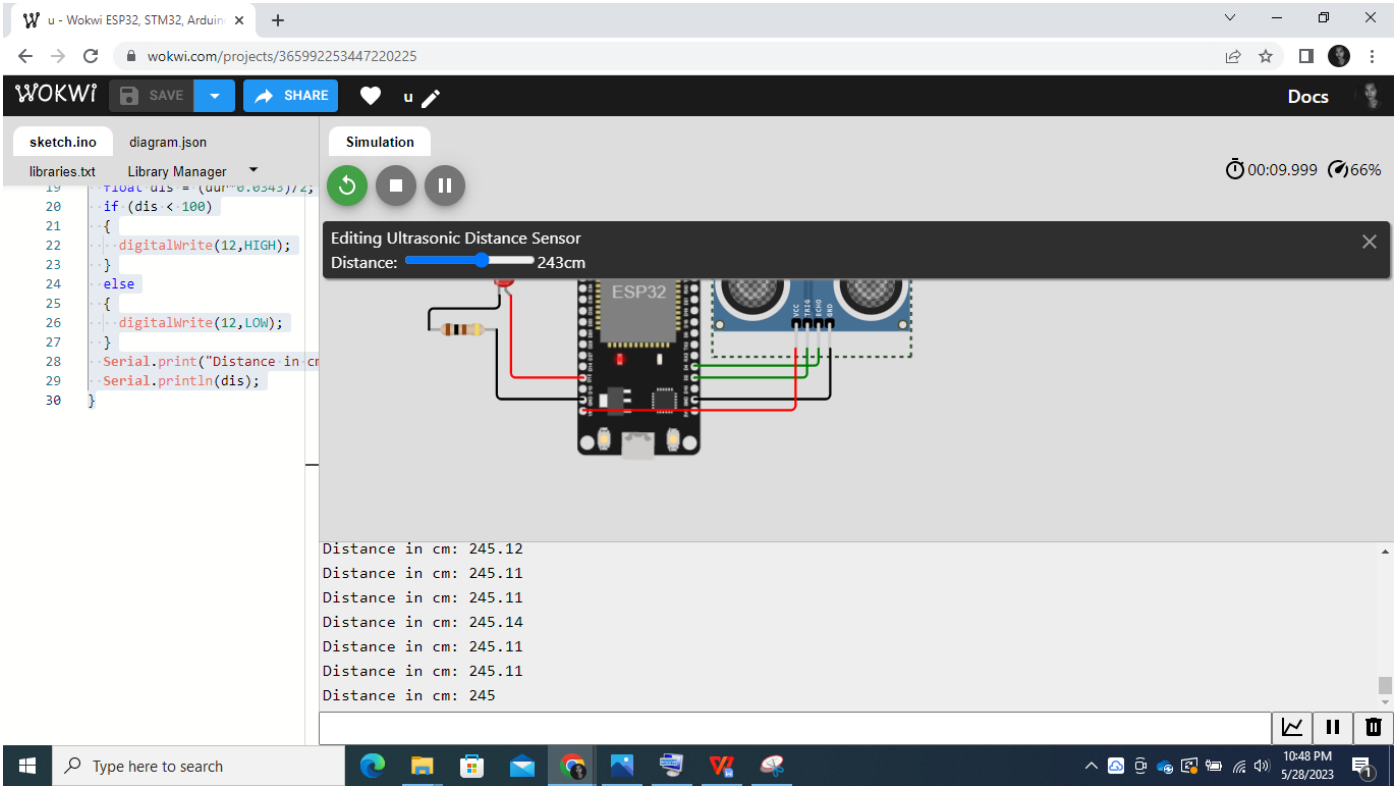
1. Place the components on the breadboard
2. Connect the Ultrasonic Sensor's TRIG pin to the ESP32's D2 pin.
3. Connect the Ultrasonic Sensor's ECHO pin to the ESP32's D4 pin.
4. Connect the Ultrasonic Sensor's GND pin to the ESP32's GND.1 pin.
5. Connect the LED's Cathode (C) to the Resistor's pin 1.
6. Connect the Resistor's pin 2 to the ESP32's GND.2 pin.
7. Connect the LED's Anode (A) to the ESP32's D12 pin.
8. Connect the Ultrasonic Sensor's VCC pin to the ESP32's VIN pin.
9. Upload the necessary code.
10. Run the simulation.

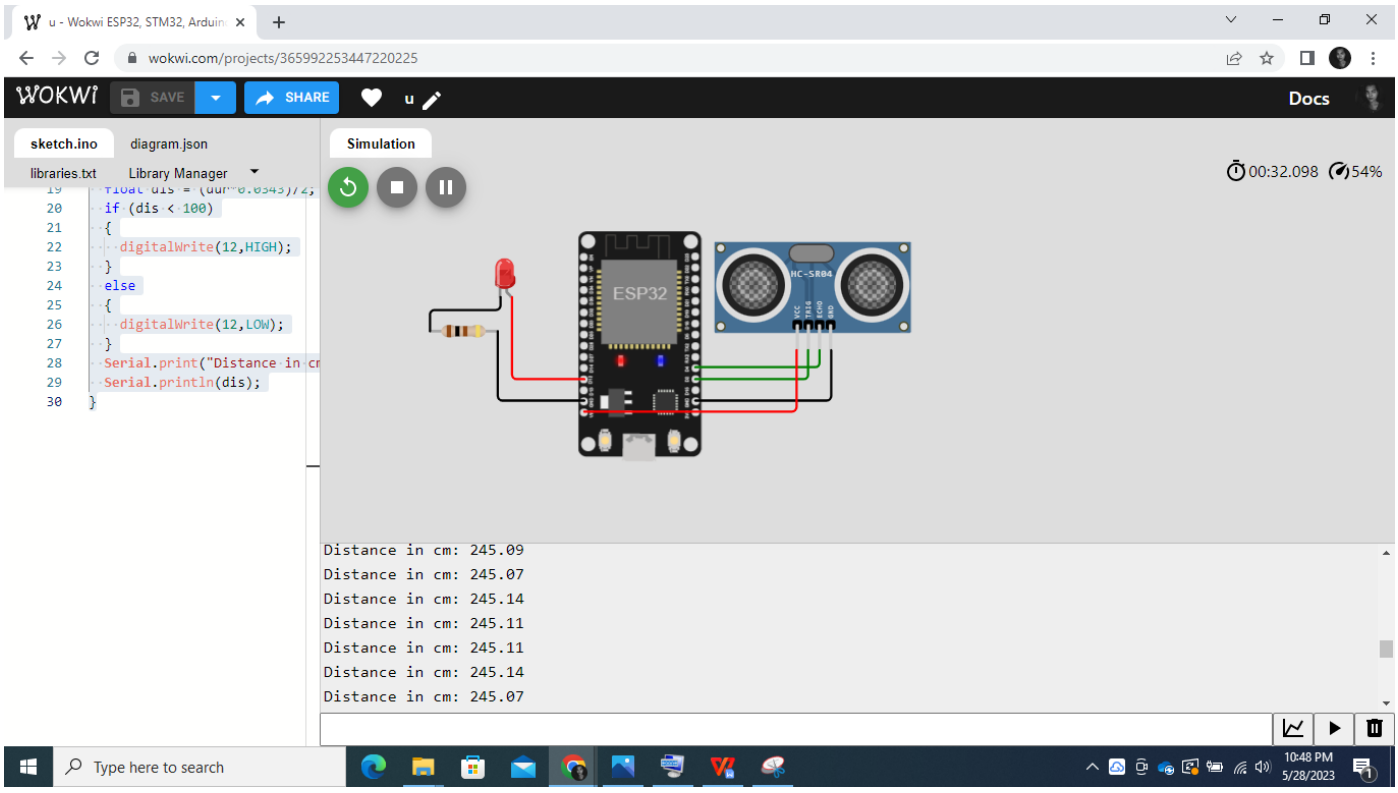
Code :

```
int trig = 2;
int echo = 4;

void setup()
{
  Serial.begin(9600);
  pinMode(trig,OUTPUT);
  pinMode(echo,INPUT);
  pinMode(12,OUTPUT);
}

void loop()
{
  digitalWrite(trig,LOW);
  digitalWrite(trig,HIGH);
  delayMicroseconds(10);
  digitalWrite(trig,LOW);
  float dur = pulseIn(echo,HIGH);
  float dis = (dur*0.0343)/2;
  if (dis < 100)
  {
    digitalWrite(12,HIGH);
  }
  else
  {
    digitalWrite(12,LOW);
  }
  Serial.print("Distance in cm: ");
  Serial.println(dis);
}
```

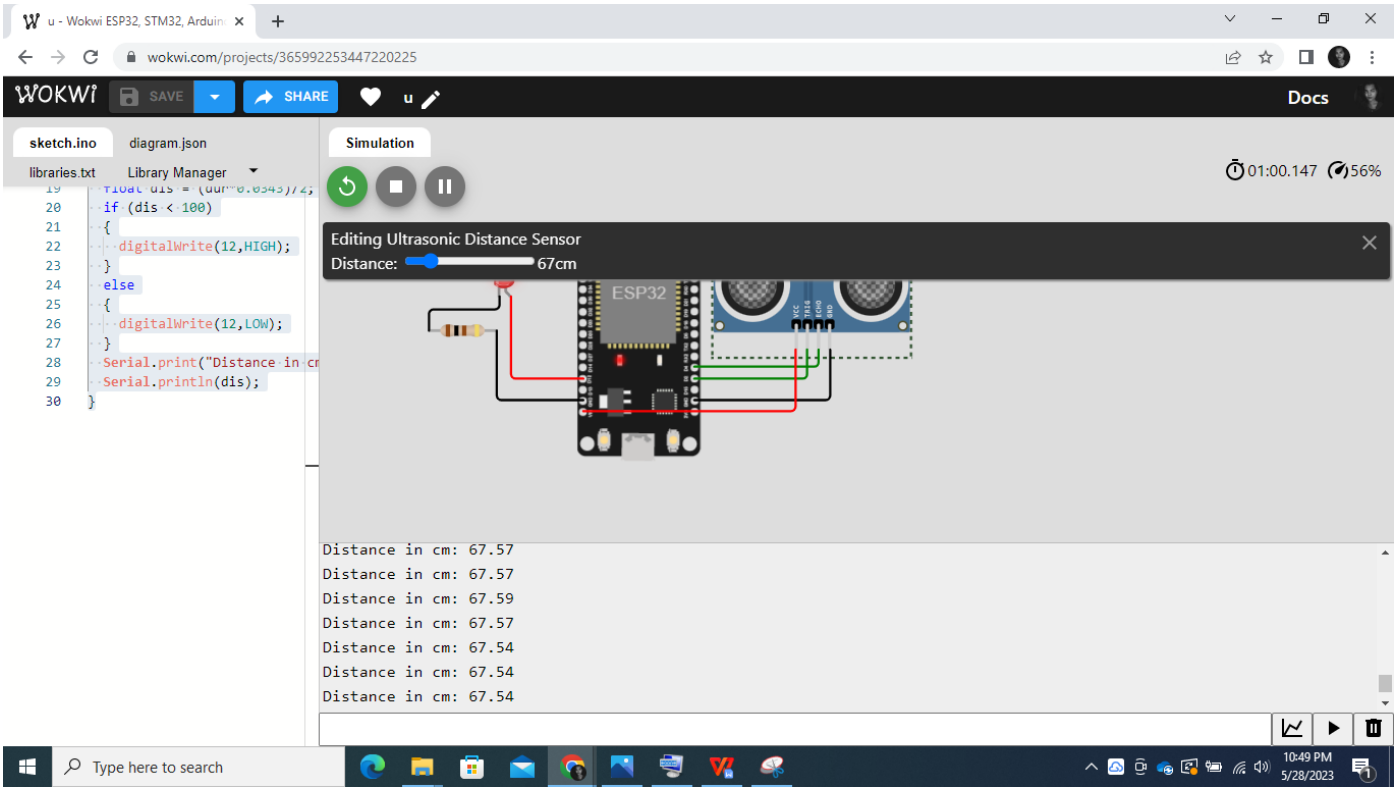
Outputs :

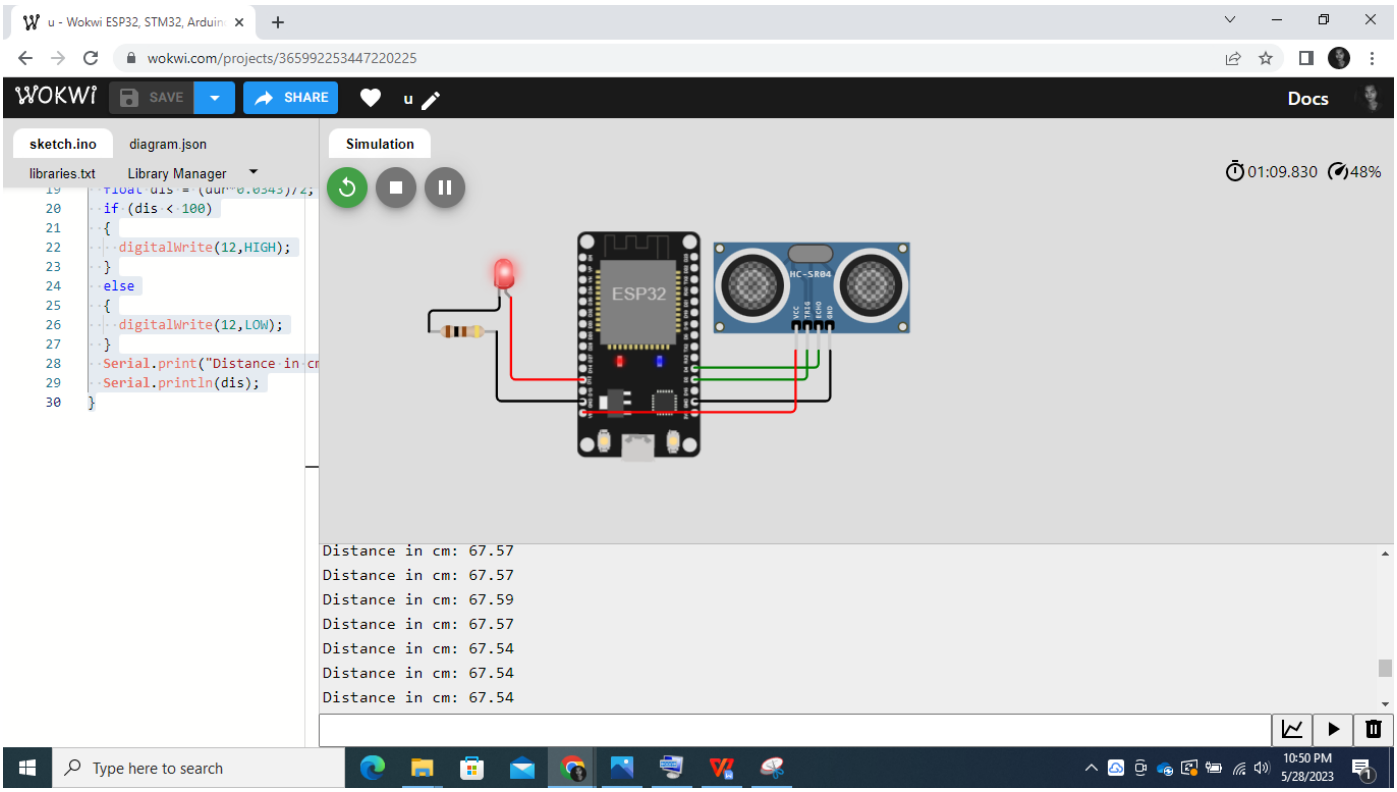
When Distance > 100 cm


u - Wokwi ESP32, STM32, Arduin
wokwi.com/projects/365992253447220225
WOKWI
SAVE
SHARE
Docs
sketch.ino
diagram.json
libraries.txt
Library Manager
Simulation
00:09.999
66%
Editing Ultrasonic Distance Sensor
Distance:
243cm
ESP32
if (dis < 100)
{
digitalWrite(12,HIGH);
}
else
{
digitalWrite(12,LOW);
}
Serial.print("Distance in cm
Serial.println(dis);
Distance in cm: 245.12
Distance in cm: 245.11
Distance in cm: 245.11
Distance in cm: 245.14
Distance in cm: 245.11
Distance in cm: 245.11
Distance in cm: 245
Type here to search
10:48 PM
5/28/2023


u - Wokwi ESP32, STM32, Arduin
wokwi.com/projects/365992253447220225
WOKWI
SAVE
SHARE
Docs
sketch.ino
diagram.json
libraries.txt
Library Manager
Simulation
00:32.098
54%
ESP32
HC-SR04
if (dis < 100)
{
digitalWrite(12,HIGH);
}
else
{
digitalWrite(12,LOW);
}
Serial.print("Distance in cm
Serial.println(dis);
Distance in cm: 245.09
Distance in cm: 245.07
Distance in cm: 245.14
Distance in cm: 245.11
Distance in cm: 245.11
Distance in cm: 245.14
Distance in cm: 245.07
Type here to search
10:48 PM
5/28/2023

When Distance < 100 cm





The circuit has been constructed in WOKWI and the LED glows when distance <100 cm

Result:

Thus, the circuit has been constructed using WOKWI and outputs have been verified.