INTERFACING IR SENSOR WITH ARDUINO UNO

Aim: To interface DHT 11 sensor with Arduino uno to measure humidity and temperature.

Components required:

- Arduino uno
- IR sensor
- Jumper wire
- Serial communication cable
- PC/Laptop

Procedure:

1)Open the Arduino IDE software & write the code

2) Connect the Laptop with ARDUINO UNO microcontroller using serial communication cable

3) Connect the IR sensor with ARDUINO UNO microcontroller

4) Upload the code

5) Verify the output in serial monitor

Code:

```
int irSensorPin = 7;


void setup() {


  pinMode(irSensorPin, INPUT);


  Serial.begin(9600);
}


void loop() {
```

```
  int irValue = digitalRead(irSensorPin);



  if (irValue == LOW) {



   Serial.println("Object detected!");
  } else {


   Serial.println("No object detected.");
  }


  delay(500);
}
```

Result: The circuit is constructed & observed the output of IR sensor the serial monitor.

INTERFACING DHT 11 SENSOR WITH ARDUINO UNO

Aim: To interface DHT 11 sensor with Arduino uno to measure humidity and temperature.

Components required:

- Arduino uno
- DHT11 sensor
- Jumper wire
- Serial communication cable
- PC/Laptop

Procedure:

1)Open the Arduino IDE software & write the code

2) Connect the Laptop with ARDUINO UNO microcontroller using serial communication cable

3) Connect the DHT11 sensor with ARDUINO UNO microcontroller

4) Upload the code

5) Verify the output in serial monitor

Code:

```
#include <Bonezegei_DHT11.h>

Bonezegei_DHT11 dht(14);

void setup() {

  Serial.begin(115200);

  dht.begin();

}


void loop() {


 if (dht.getData()) {

   float tempDeg = dht.getTemperature();
```

```
    float tempFar = dht.getTemperature(true);

    int hum = dht.getHumidity();

    String str  = "Temperature: ";

        str += tempDeg;

        str += "°C  ";

        str += tempFar;

        str += "°F  Humidity:";

        str += hum;

    Serial.println(str.c_str());

      }

  delay(2000);

}
```

Result: The circuit is constructed & observed the output of measured humidity & temperature value on the serial monitor.

INTERFACING ULTRASONIC SENSOR WITH ESP32 Microcontroller

Aim: To interface an Ultrasonic sensor with ESP32 and to find the distance of object.

Components Required:

- ESP32 Microcontroller
- Ultrasonic Sensor HC-SR04
- Jumper wires
- PC/Laptop with Arduino IDE
- Serial communication cable

Procedure:

1. Open Arduino IDE and enter the code.
2. Connect the Ultrasonic Sensor HC-SR04 to ESP32 as per their pins
3. Connect the ESP32 to the PC/Laptop and upload the code to it
4. Verify the Output in the serial monitor.

Code:

```
#include <Ultrasonic.h>


Ultrasonic ultrasonic1(12, 13);

Ultrasonic ultrasonic2(10);

Ultrasonic ultrasonic3(8);


void setup() {

 Serial.begin(9600);

}


void loop() {

 Serial.print("Sensor 01: ");

 Serial.print(ultrasonic1.read());
```

```
    Serial.println("cm");


    Serial.print("Sensor 02: ");

    Serial.print(ultrasonic2.read(CM));

    Serial.println("cm");


    Serial.print("Sensor 03: ");

    Serial.print(ultrasonic3.read(INC));

    Serial.println("inc");


   delay(1000);
}
```

Result: The circuit is constructed & the distance is measured & observed on the serial monitor.

INTERFACING ULTRASONIC SENSOR WITH ARDUINO UNO

Aim: To interface an Ultrasonic sensor with Arduino UNO to find the distance of object.

Components Required:

- Arduino UNO
- Ultrasonic Sensor HC-SR04
- Jumper wires
- PC/Laptop with Arduino IDE
- Serial communication cable

Procedure:

1. Open Arduino IDE and enter the code.
2. Connect the Ultrasonic Sensor HC-SR04 to Arduino UNO as per their pins
3. Connect the Arduino UNO to the PC/Laptop and upload the code to it
4. Verify the Output in the serial monitor.

Code:

```
#include <Ultrasonic.h>

Ultrasonic ultrasonic1(12, 13);

Ultrasonic ultrasonic2(10);

Ultrasonic ultrasonic3(8);

void setup() {
  Serial.begin(9600);
}

void loop() {
  Serial.print("Sensor 01: ");

  Serial.print(ultrasonic1.read());
```

```
   Serial.println("cm");


   Serial.print("Sensor 02: ");

   Serial.print(ultrasonic2.read(CM));

   Serial.println("cm");


   Serial.print("Sensor 03: ");

   Serial.print(ultrasonic3.read(INC));

   Serial.println("inc");


  delay(1000);
}
```

Result: The circuit is constructed & the distance is measured & observed on the serial monitor.