ENVIRONMENTAL MONITORING USING IOT

PHASE 3

SENSOR DESIGN SIMULATION AND ITS CODE

AIM:

To design and simulate Temperature & Humidity sensors using ESP32 as an IoT Interface with python program.

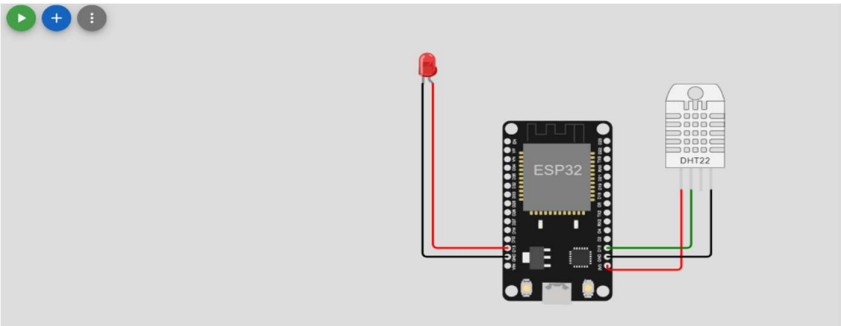
COMPONENTS USED:

SOFTWARE USED-WOKWI

IoT DEVICE -ESP32

SENSOR USED -DHT22

CIRCUIT DESIGN:



PYTHON CODE:

```
import machine
import dht
import network
import urequests
import time

DHT_PIN = 15
LED_PIN = 2  # Assuming you are using NodeMCU or similar with built-in LED
WIFI_NAME = "Wokwi-GUEST"
WIFI_PASSWORD = ""
myChannelNumber = 2306875
myApiKey = "LGD2VGLYYVTP3YV9"
server = "api.thingspeak.com"
```

```
dhtSensor = dht.DHT22(machine.Pin(DHT_PIN))
led = machine.Pin(LED_PIN, machine.Pin.OUT)

def connect_wifi():
    wlan = network.WLAN(network.STA_IF)
    if not wlan.isconnected():
        print("Connecting to WiFi...")
        wlan.active(True)
        wlan.connect(WIFI_NAME, WIFI_PASSWORD)
        while not wlan.isconnected():
            pass
    print("WiFi connected!")
    print("Local IP:", wlan.ifconfig()[0])

def push_to_thingspeak(data):
    url =
"https://api.thingspeak.com/update?api_key={0}&field1={1}&field2={2}".format(m
yApiKey, data["temperature"], data["humidity"])
    response = urequests.get(url)
    return response.status_code

def read_dht_sensor():
    dhtSensor.measure()
    return {
        "temperature": dhtSensor.temperature(),
        "humidity": dhtSensor.humidity()
    }

connect_wifi()

while True:
    sensor_data = read_dht_sensor()
    led.value(1 if sensor_data["temperature"] > 35 or
sensor_data["temperature"] < 12 or sensor_data["humidity"] > 70 or
sensor_data["humidity"] < 40 else 0)

    response_code = push_to_thingspeak(sensor_data)
    print("Temp: {:.2f}°C".format(sensor_data["temperature"]))
    print("Humidity: {:.1f}%".format(sensor_data["humidity"]))

    if response_code == 200:
        print("Data pushed successfully")
    else:
        print("Push error", response_code)

    print("---")
    time.sleep(10)  # Sleep for 10 seconds
```

OUTPUT WITH CODE: