CS23E01 / EMBEDDED SYSTEMS AND INTERNET OF THINGS

- Session: July-Nov 2026 (B.E. CSE – VII sem)

Activities for Lab-10:

Topics: Using sensors, relay with Pi, using python libraries RPI.GPIO or PIGPIO, Thonny IDE, Azure IOT web simulator

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1. Using a relay operate a mini fan.

2. Publish sensor data on a webpage. (Install flask and create web server on pi, create a webpage (say index.html to access it at port 5000), and display the sensor data on the webpage)

3. connecting Raspberry pi to Azure IOT hub and send telemetry/sensor data read as in exercise no.2.

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Ex:2 (steps)

1. sudo apt update
   sudo apt install python3-flask -y //install flask
2. mkdir ~/sensor_server
   cd ~/sensor_server
   mkdir templates // templates directory for webapps
3. nano templates/index.html //webpage
4. `<body> <h1> Live Raspberry Pi Sensor Data</h1> <h3>Temperature</h3> <p class="value">{{ temperature }} °C</p> </div> <div class="card"> <h3>Humidity</h3> <p class="value">{{ humidity }} %</p> </div> </body>`

5. nano app.py //create web server app

```
@app.route("/")
def index():
      temp, hum = read_sensor_data()
      return render_template("index.html", temperature=temp, humidity=hum)
def read_sensor_data():  //random function to generate sensor data
      temperature = round(random.uniform(20.0, 30.0), 1)
      humidity = round(random.uniform(40.0, 60.0), 1)
      return temperature, humidity
```

6. // run server and read data

python3 app.py

7. http://localhost:5000

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Ex.No.3 (references)

https://learn.microsoft.com/en-us/azure/iot-hub/raspberry-pi-get-started

