from flask import Flask, render\_template\_string

import RPi.GPIO as GPIO

app = Flask(\_\_name\_\_)

# GPIO setup

GPIO.setmode(GPIO.BCM)

GPIO.setup(21, GPIO.OUT)

# HTML template for the web interface

html\_template = """

<!DOCTYPE html>

<html lang="en">

<head>

<meta charset="UTF-8">

<meta name="viewport" content="width=device-width, initial-scale=1.0">

<title>Bulb Control</title>

<link href="https://cdn.jsdelivr.net/npm/bootstrap@5.3.0/dist/css/bootstrap.min.css" rel="stylesheet">

<style>

body {

background-color: #f8f9fa;

}

.container {

max-width: 600px;

margin-top: 50px;

}

.status {

font-size: 1.2rem;

font-weight: bold;

padding: 15px;

border-radius: 5px;

text-align: center;

}

.status-on {

background-color: #d4edda;

color: #155724;

}

.status-off {

background-color: #f8d7da;

color: #721c24;

}

.btn {

padding: 15px 30px;

font-size: 1.1rem;

margin: 10px;

}

</style>

</head>

<body>

<div class="container">

<h1 class="text-center mb-4">Bulb Control</h1>

<form action="/control" method="post" class="text-center">

<button name="action" value="on" class="btn btn-success">Turn ON</button>

<button name="action" value="off" class="btn btn-danger">Turn OFF</button>

</form>

<p class="status {% if status == 'ON' %}status-on{% else %}status-off{% endif %}">

Current Bulb Status: {{ status }}

</p>

</div>

<script src="https://cdn.jsdelivr.net/npm/bootstrap@5.3.0/dist/js/bootstrap.bundle.min.js"></script>

</body>

</html>

"""

@app.route('/')

def index():

# Get current bulb status

status = "ON" if GPIO.input(21) == GPIO.HIGH else "OFF"

return render\_template\_string(html\_template, status=status)

@app.route('/control', methods=['POST'])

def control():

from flask import request

action = request.form.get('action')

if action == 'on':

GPIO.output(21, GPIO.HIGH)

status = "ON"

elif action == 'off':

GPIO.output(21, GPIO.LOW)

status = "OFF"

else:

status = "Unknown action"

return render\_template\_string(html\_template, status=status)

if \_\_name\_\_ == '\_\_main\_\_':

try:

app.run(host='0.0.0.0', port=5000, debug=False)

finally:

GPIO.cleanup()