ARDUINO CODE

void setup() {

pinMode(13, OUTPUT); // LED on pin 13

Serial.begin(9600); // Start serial communication

}

void loop() {

if (Serial.available() > 0) {

char command = Serial.read(); // Read the incoming byte

if (command == '1') {

digitalWrite(13, HIGH); // Turn LED on

} else if (command == '0') {

digitalWrite(13, LOW); // Turn LED off

}

}

}

PYTHON CODE

from fastapi import FastAPI

import serial

import threading

import time

app = FastAPI()

# Global serial connection

arduino = None

@app.on\_event("startup")

def startup\_event():

global arduino

try:

arduino = serial.Serial('COM3', 9600, timeout=1)

time.sleep(2) # Allow Arduino to initialize

print("Serial connection established.")

except serial.SerialException as e:

print(f"Error establishing serial connection: {e}")

@app.on\_event("shutdown")

def shutdown\_event():

global arduino

if arduino and arduino.is\_open:

arduino.close()

print("Serial connection closed.")

@app.post("/led/on")

def turn\_led\_on():

global arduino

if arduino and arduino.is\_open:

arduino.write(b'1')

return {"status": "success", "message": "LED turned ON"}

else:

return {"status": "error", "message": "Serial connection is not open."}

@app.post("/led/off")

def turn\_led\_off():

global arduino

if arduino and arduino.is\_open:

arduino.write(b'0')

return {"status": "success", "message": "LED turned OFF"}

else:

return {"status": "error", "message": "Serial connection is not open."}