	Marwadi University Faculty of Engineering & Technology Department of Information and Communication Technology		
Subject: Programming With Python (01CT1309)	**Aim:** To control an LED connected to an Arduino Uno using Python via serial communication (PySerial)		
Experiment No: 26	**Date:**		**Enrollment No: 92400133131**

GITHUB LINK:- https://github.com/meet91-hub/python-programming-lab-exp-26.git

Aim: To control an LED connected to an Arduino Uno using Python via serial communication (PySerial)

IDE: Spyder & Arduino IDE

Installation   pip   install

PySerial

Hardware

Circuit Diagram:

LED Anode (+) → Arduino Pin 13 LED

Cathode (-) → 220Ω Resistor → GND

Arduino Code: void setup() {   pinMode(13,

OUTPUT); // Set LED pin as output

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

}

void loop() {   if (Serial.available()) { // Check if data is received

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

if (command == '1') {   digitalWrite(13, HIGH); // Turn ON LED

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

digitalWrite(13, LOW); // Turn OFF LED   }

 }

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}

Python Code import

serial import time

Initialize Serial Communication (Replace 'COM3' with the correct port)

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

time.sleep(2) # Allow time for Arduino to reset

def send_command(command):

    arduino.write(command.encode()) # Send command as bytes

print(f"Sent: {command}")

while True:

    user_input = input("Enter '1' to turn ON LED, '0' to turn OFF, 'q' to quit: ")

if user_input in ['1', '0']:   send_command(user_input)   elif user_input

== 'q':   print("Exiting...")

        break

else:

    print("Invalid input! Enter '1', '0', or 'q'.")

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Test the LED Control:

Type 1 → LED should turn ON.

Type 0 → LED should turn OFF.

Type q → Script exits.

Post Lab

Write python script to continuously send commands ('ON' or 'OFF') to control an LED on Arduino.

CODE:

```
const int ledPin = 13;

void setup() {
    Serial.begin(9600);
pinMode(ledPin, OUTPUT);
  }    void
loop() {
    if (Serial.available()) {
        String command = Serial.readStringUntil('\n');
if (command == "ON") {
digitalWrite(ledPin, HIGH);          } else if (command
== "OFF") {          digitalWrite(ledPin, LOW);
      }
    }
  }
```

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