	Marwadi University
	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: 92510133025**

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

```python
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
```

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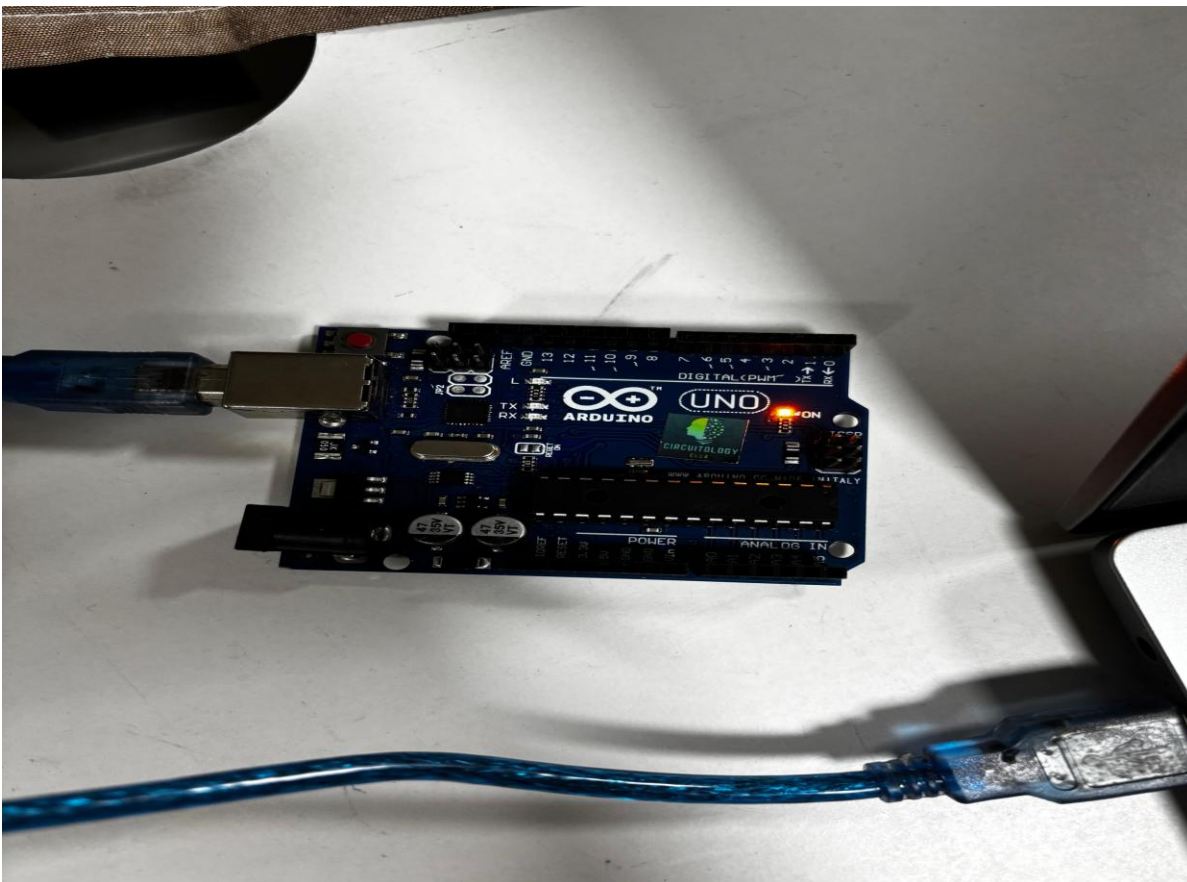
    print("Invalid input! Enter '1', '0', or 'q'.")

Test the LED Control:

Type 1 → LED should turn ON.

Type 0 → LED should turn OFF.

Type q → Script exits.

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Post Lab

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

```python
import serial
import time

ser = serial.Serial('COM3', 9600, timeout=1)  # Update COM port
time.sleep(2)  # Allow time for connection setup

while True:
    command = input("Enter command (ON/OFF): ").strip()
    if command in ["ON", "OFF"]:
        ser.write((command + '\n').encode())  # Send command
        print(f"Sent: {command}")
    else:
        print("Invalid command. Enter ON or OFF.")

ser.close()
```

Arduino Uno Code

```cpp
#define LED_PIN 13

void setup() {
    Serial.begin(9600);
    pinMode(LED_PIN, OUTPUT);
}

void loop() {
    if (Serial.available() > 0) {
        String command = Serial.readStringUntil('\n');
        command.trim();

        if (command == "ON") {
            digitalWrite(LED_PIN, HIGH);
            Serial.println("LED Turned ON");
        } else if (command == "OFF") {
            digitalWrite(LED_PIN, LOW);
            Serial.println("LED Turned OFF");
```

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```
        }
    }
}
```
Github link: https://github.com/JenishDesai5115/PWP_postlabs