



<b>Subject: Programming With Python (01CT1309)</b>	Aim: To control an LED connected to an Arduino Uno using Python via serial communication (PySerial)	
<b>Experiment No: 26</b>	<b>Date:</b>	<b>Enrollment No: 92510133011</b>

**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
```



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else:

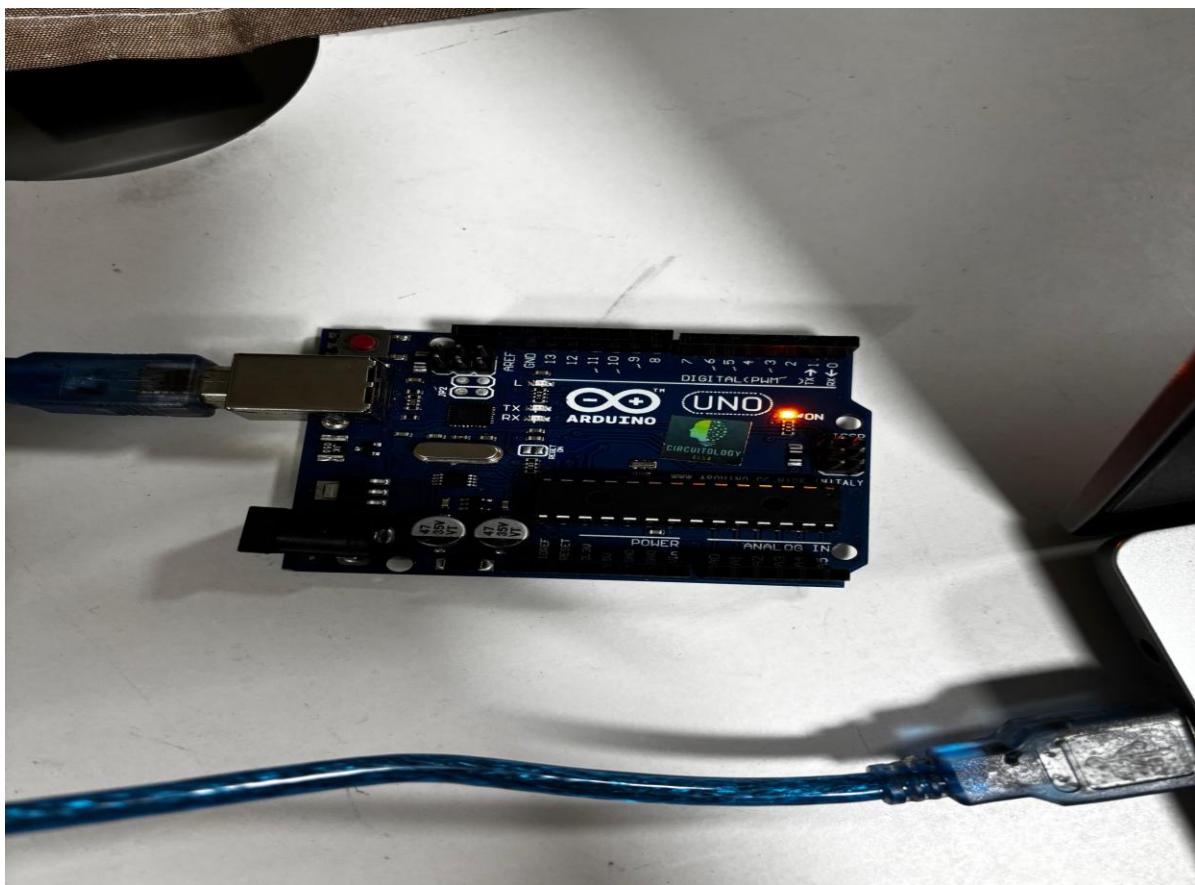
```
    print("Invalid input! Enter '1', '0', or 'q'.")
```

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**

```
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**

```
#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](https://github.com/JenishDesai5115/PWP_postlabs)