Mawlana Bhashani Science and Technology University

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Lab Report

Lab Report No: 05

Lab Report On: Introduction to IoT and Blinking LED using Mobile App and Internet Server

Course Title: Computer Peripheral and Interfacing Lab

Course Code: ICT-3206

Submitted by:	Submitted to:
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Introduction to IoT and Blinking LED using Mobile App and Internet Serve

Introduction:

This lab introduces the basic concept of the Internet of Things (IoT) by demonstrating how a simple LED can be controlled remotely using a mobile app and the internet. Using the Blynk platform along with an ESP8266 microcontroller, the LED is connected to a cloud server and can be toggled from anywhere via a smartphone app. This experiment provides a hands-on understanding of IoT architecture, cloud connectivity, and mobile-app-based device control.

Objectives:

- To understand the fundamentals of IoT and cloud-connected devices.
- To set up and configure the Blynk IoT platform.
- To control an LED remotely via mobile app and internet connection.
- To integrate microcontrollers with Wi-Fi and mobile interfaces.
- To develop a basic IoT-based LED control system.

Components :

- NodeMCU ESP8266 / ESP32
- LED
- Resistor (220Ω)
- Breadboard and Jumper wires
- Smartphone with Blynk App
- Internet connection

Circuit Diagram:

NodeMCU control Relay with Blynk
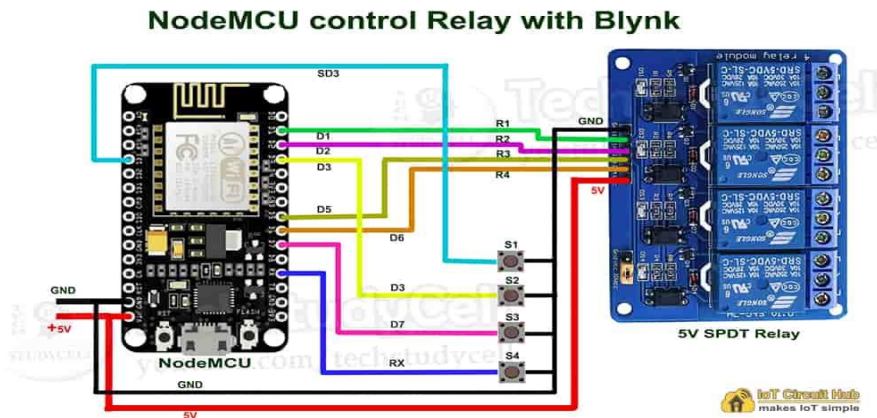
Connect the positive leg (anode) of the LED to digital pin D1 of NodeMCU. Connect the negative leg (cathode) of the LED to GND via a 220Ω resistor.

Working Procedure:

- Install the Blynk app from Google Play Store or Apple App Store.
- Create a new project in the Blynk app. Select device as ESP8266 and connection type as WiFi.
- An Auth Token will be sent to your email. Replace it in the code below.
- Add a button widget in the app and link it to Digital Pin D1.
- Upload the code below to the NodeMCU using Arduino IDE.
- Connect NodeMCU to your WiFi using the provided SSID and password.
- Press the button in the app to turn the LED on and off.

Code:

```
#define BLYNK_PRINT Serial
#include <ESP8266WiFi.h>
#include <BlynkSimpleEsp8266.h>

char auth[] = "YourAuthToken";
char ssid[] = "YourWiFiSSID";
char pass[] = "YourWiFiPassword";

void setup()
{
  Serial.begin(9600);
  Blynk.begin(auth, ssid, pass);
}

void loop()
{
  Blynk.run();
}
```

Results:

- The LED successfully turns ON and OFF via the mobile app using Blynk.
- The ESP8266 connects to the internet and communicates with the Blynk cloud server.
- Mobile app provides real-time control of physical hardware through IoT.
- Demonstrates a basic yet effective application of IoT in smart home systems.

Conclusion:

The "Introduction to IoT and Blinking LED using Mobile App and Internet Server" project successfully demonstrates a simple IoT system where an LED can be controlled using a smartphone over the internet. This lab helped in understanding key IoT concepts like cloud communication, real-time control, and mobile interfacing. With more sensors and actuators, such systems can be scaled for home automation, industrial monitoring, and smart city applications.