**design a system to control an led light using arduino and a mobile app**

You will be able to **turn ON/OFF an LED** using a **mobile app** that communicates with an **Arduino board** through **Bluetooth**.

**🔧 Components Required:**

1. **Arduino Uno** (or any other compatible board)
2. **Bluetooth module (HC-05 or HC-06)**
3. **LED**
4. **220Ω resistor**
5. **Jumper wires**
6. **Breadboard**
7. **Smartphone**
8. **Mobile App (like Bluetooth Terminal or custom app)**

## ⚙️ Circuit Diagram:

## Arduino Pin | Connects To

## -----------------|-------------------------

## D13 | LED +ve (through 220Ω resistor)

## GND | LED -ve

## TX (Pin 1) | RX of HC-05

## RX (Pin 0) | TX of HC-05

## 5V | VCC of HC-05

## GND | GND of HC-05

**Note:** Use voltage divider for HC-05 TX to Arduino RX to avoid 5V damage (optional but recommended).

## 🧠 Arduino Code:

## char data = 0;

## void setup() {

## pinMode(13, OUTPUT); // LED connected to digital pin 13

## Serial.begin(9600); // Start serial communication at 9600 baud rate

## }

## void loop() {

## if (Serial.available()) {

## data = Serial.read(); // Read the incoming data

## if (data == '1') {

## digitalWrite(13, HIGH); // Turn LED ON

## } else if (data == '0') {

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

## }

## }

## }

## 📱 Mobile App :

* **App:** "Bluetooth Terminal" or "Serial Bluetooth Terminal" (Android)
* **How to Use:**
  + Pair your phone with HC-05.
  + Open the app, connect to HC-05.
  + Send 1 to turn ON LED, 0 to turn it OFF.

## 💡 Working:

1. Power Arduino and connect HC-05.
2. Pair your phone with HC-05 using password 1234 or 0000.
3. Open Bluetooth Terminal.
4. Send 1 to turn ON the LED, 0 to turn it OFF.

## 🔁 Extensions You Can Try:

* Use **voice control** using Google Assistant + IFTTT
* Add a **brightness control** using PWM
* Use **Wi-Fi (ESP8266 or ESP32)** instead of Bluetooth for remote access

