IoT Based Smart Street Light Project

The **IoT Based Smart Street Light** project using **Arduino + ESP-01** is a beginner-friendly IoT application. It automatically controls street lights based on **ambient light conditions** using an LDR sensor and provides **remote monitoring & control** via the **iTechBuilders IoT Platform**. Students and hobbyists can learn **automation, IoT connectivity, and cloud control** in one practical project.

Why Start with Smart Street Light?

• Simple project with Arduino + ESP-01

• LDR sensor controls light automatically

• IoT cloud integration with iTechBuilders platform

• Remote ON/OFF control from web or mobile

• Practical use case for smart cities

Key Features for Beginners

• Automatic light ON/OFF using LDR

• Arduino UNO as main controller

• ESP-01 for Wi-Fi and IoT connectivity

• Data logging & remote commands via iTechBuilders IoT

• Low-cost and scalable project

Hardware Basics

The project uses **Arduino UNO** to read an **LDR sensor** for detecting darkness. A relay/LED is used to simulate the **street light**. The **ESP-01 Wi-Fi module** connects the Arduino to the **iTechBuilders IoT cloud** for remote monitoring and control.

Connections

Component	Connection
LDR Sensor	A0 of Arduino
Street Light (LED/Relay)	D3 of Arduino
ESP-01 TX/RX	Arduino RX/TX (via voltage divider)
ESP-01 VCC/CH_PD	3.3V supply
GND	Common ground

Quick Specs

• Controller: Arduino UNO/Nano

- Wi-Fi: ESP-01 (ESP8266)

- Sensor: LDR + Resistor

- Output: LED/Relay (Street Light)

- IoT: iTechBuilders IoT Cloud Platform

Arduino Code Example

```
// IoT Smart Street Light (Arduino + ESP-01 + iTechBuilders IoT)

int ldrPin = A0;
int lightPin = 3;
int ldrValue = 0;

void setup() {
  pinMode(lightPin, OUTPUT);
  Serial.begin(9600); // For ESP-01 Communication
}

void loop() {
  ldrValue = analogRead(ldrPin);

  if (ldrValue < 500) { // Dark
    digitalWrite(lightPin, HIGH);
    Serial.println("LIGHT_ON"); // Send to IoT
  } else {
    digitalWrite(lightPin, LOW);
    Serial.println("LIGHT_OFF"); // Send to IoT
  }

  delay(2000); // Send data every 2 sec
}
```

Learning Outcomes

- Learn LDR interfacing with Arduino

- Understand ESP-01 Wi-Fi communication

- Send sensor data to iTechBuilders IoT cloud

- Remotely monitor and control street lights

Next Steps & Applications

After building this project, learners can extend it with **multiple street lights in a network**, **motion detection for energy saving**, and **data analytics** on iTechBuilders IoT cloud. This project is a stepping stone towards **Smart City automation**.

Get Started with iTechBuilders IoT

iTechBuilders provides **IoT starter kits, tutorials, and cloud platform access** for **students, schools, and IoT innovators**. Build your own **smart street light** and expand it into **smart city projects** with **real-time monitoring, dashboards, and automation**. **Contact us** today to start your IoT journey with iTechBuilders.