IoT Programming Midterm Project (21KHDL)

SMART LIGHTING CONTROL SYSTEM

Get Started

Presented by **Tran Hieu Tam (21127423)**

1. Auto Mode:

- A light sensor detects day or night conditions.
- During the day, the light will remain off. At night, the light will blink.

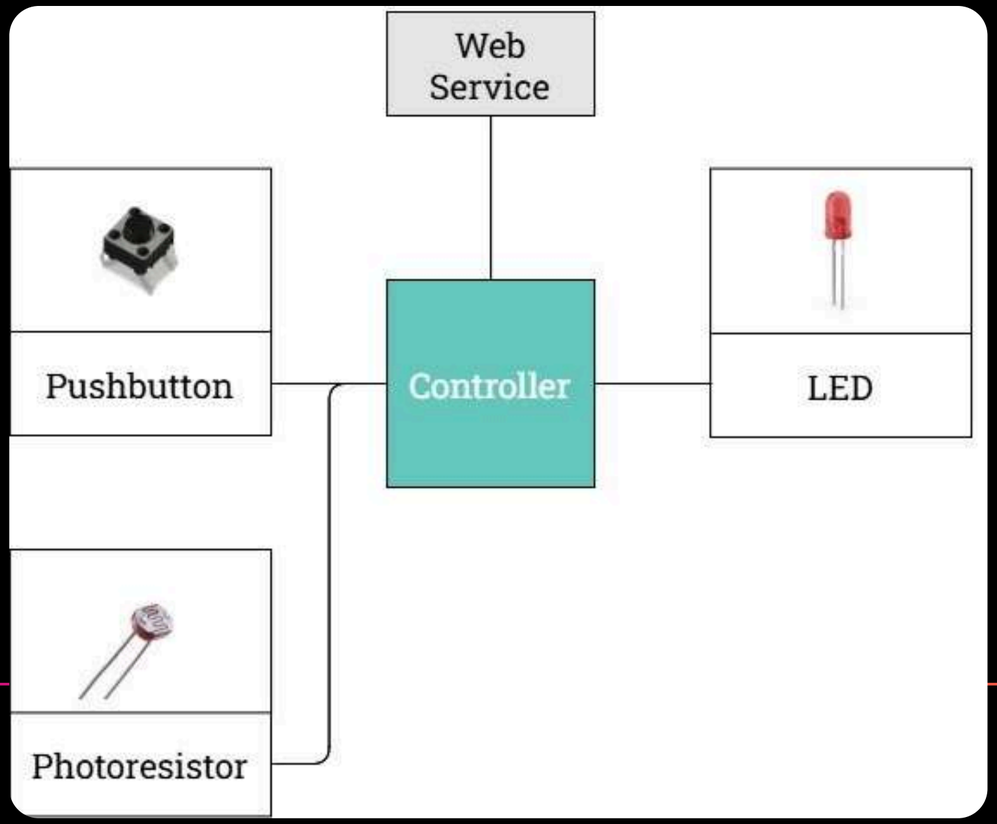
2. Manual Mode:

- A button allows you to turn the light on or off manually. If the light is off, pressing the button will turn it on, and vice versa.
- After either N minutes or a change in the day/night cycle, the system will automatically revert to Auto Mode.

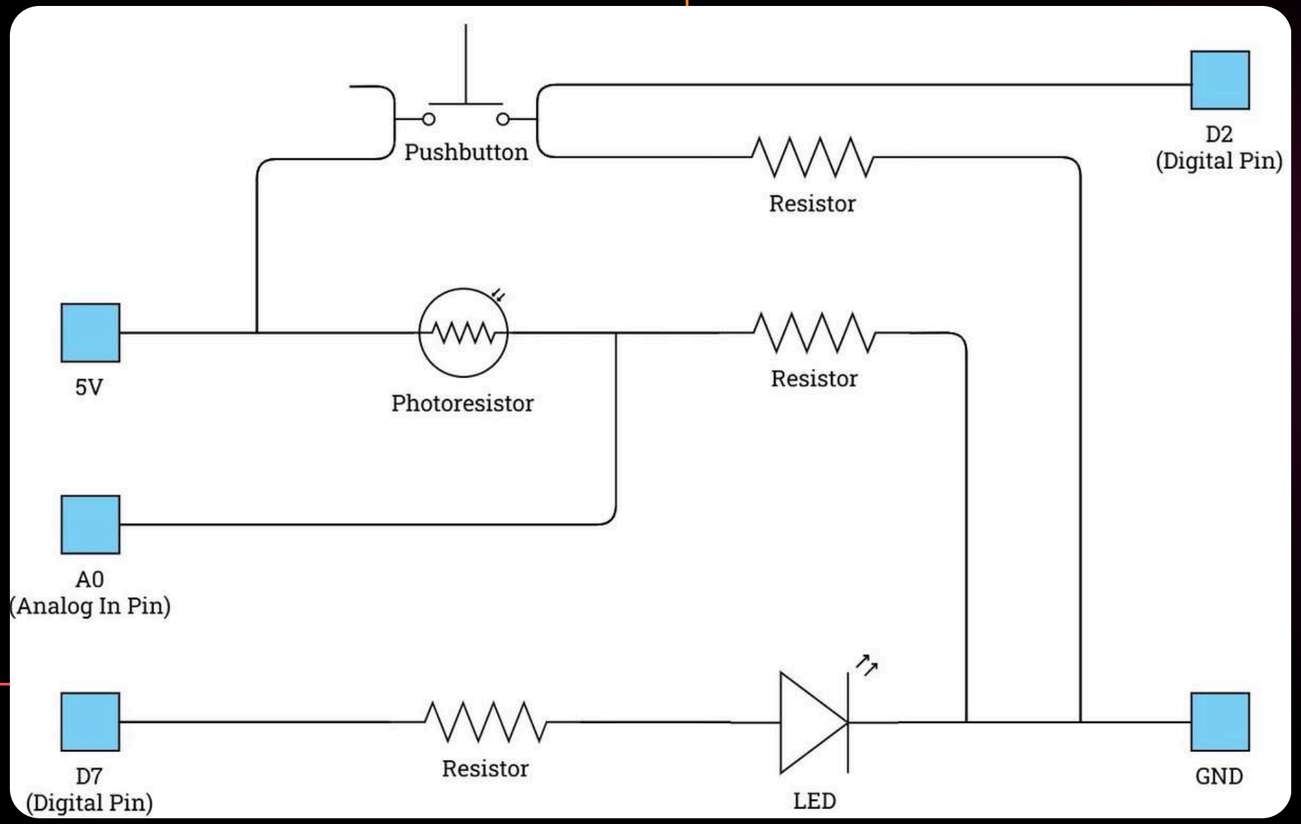
3. Web Dashboard Interface:

- Displays the current status of the light (on, off, or blinking).
- Includes a control button for remote on/off control of the light, similar to the physical button.

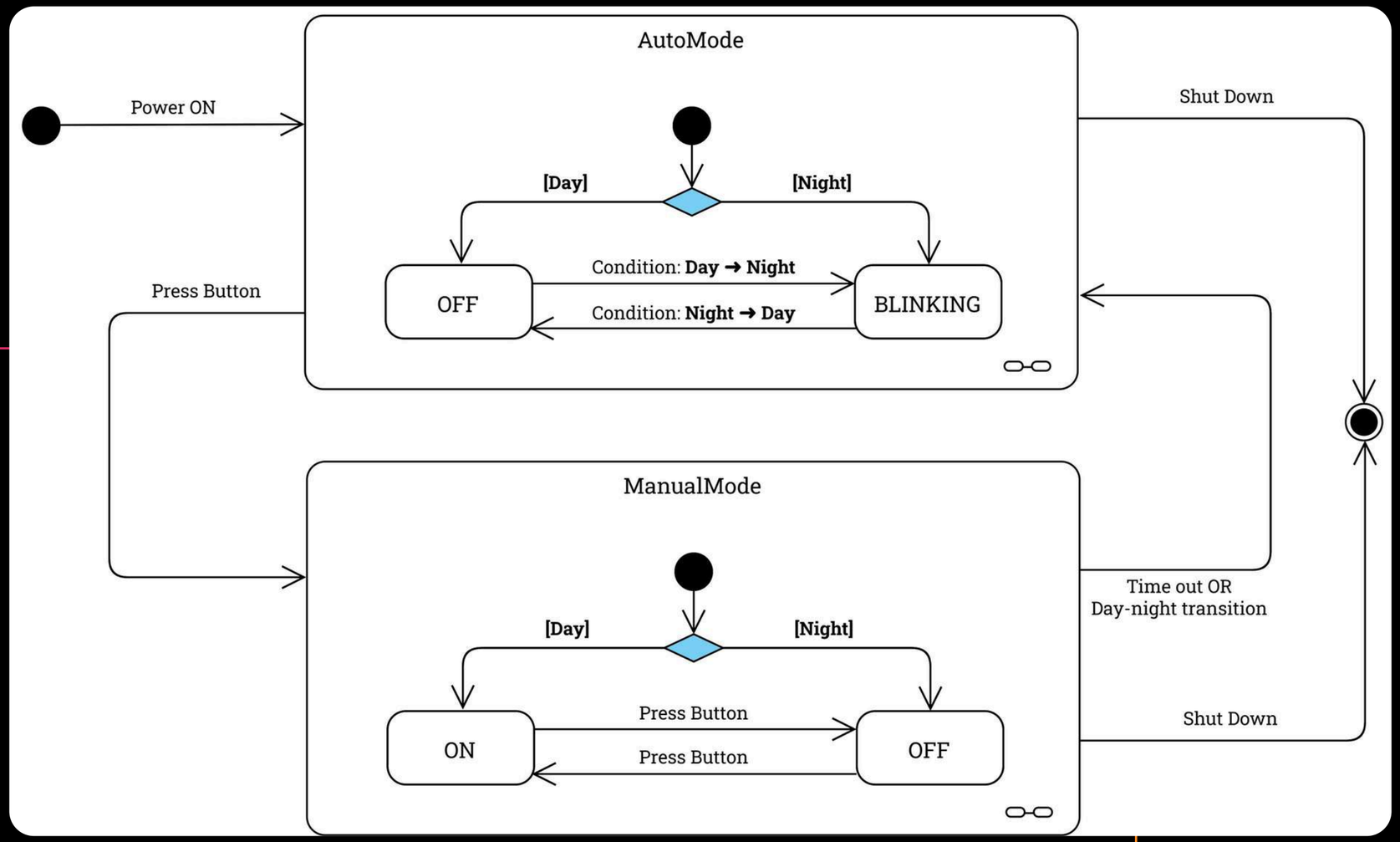
Project Requirements



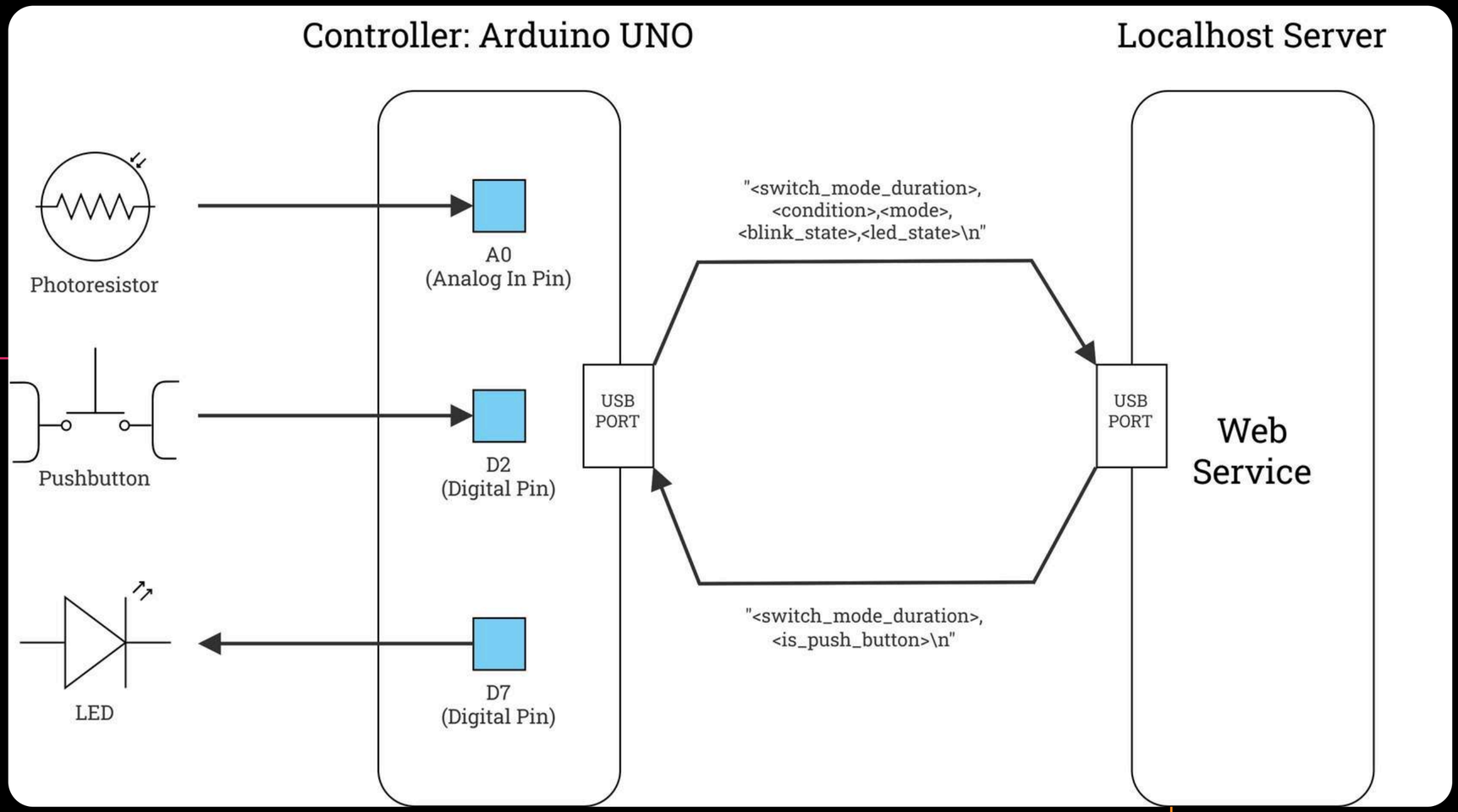
System Design



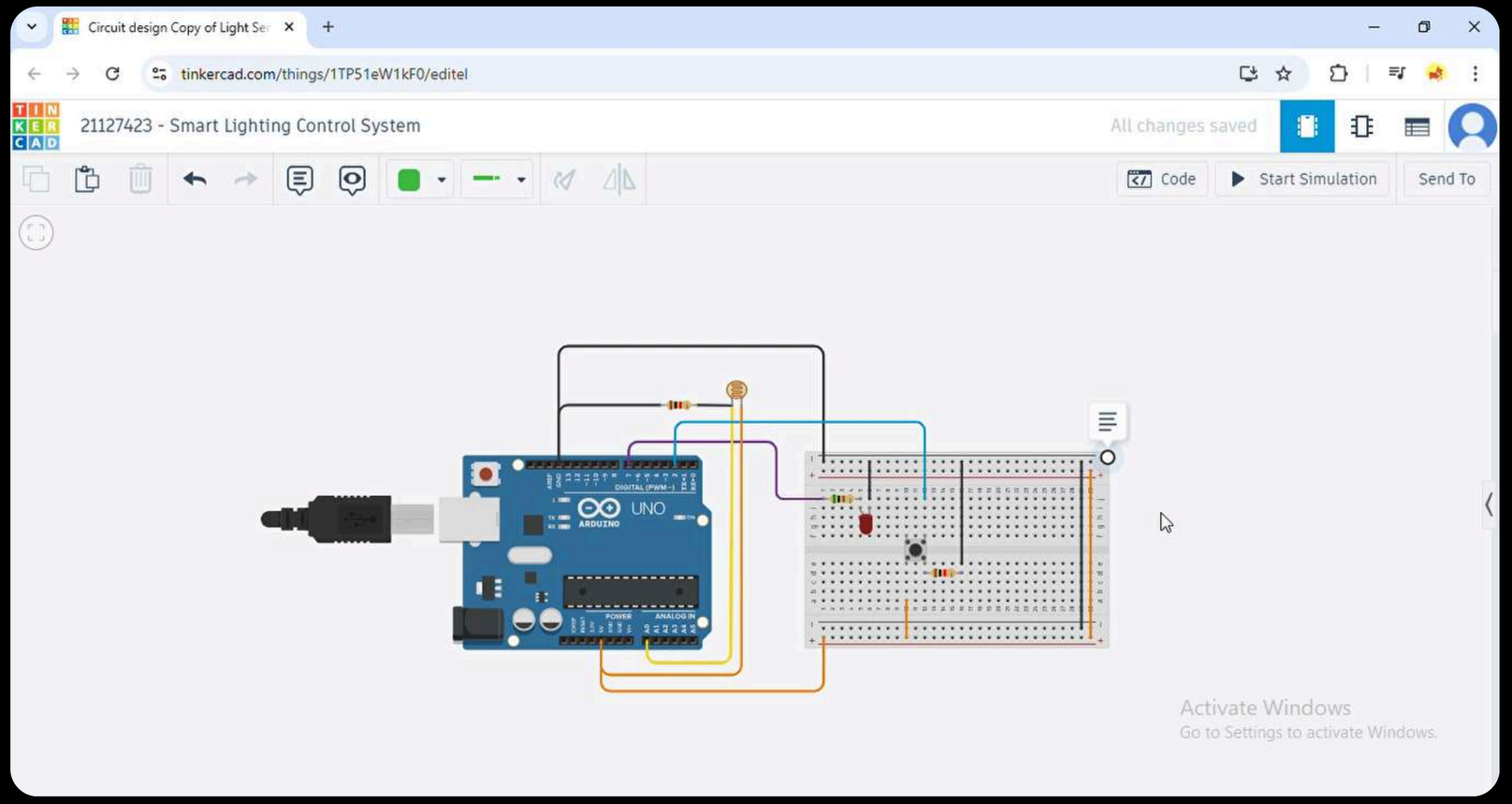
System Circuit



Finite-state machine for Smart Lighting Control System



Data communication Diagram



Smart Lighting Control System Simulation on Tinkercad

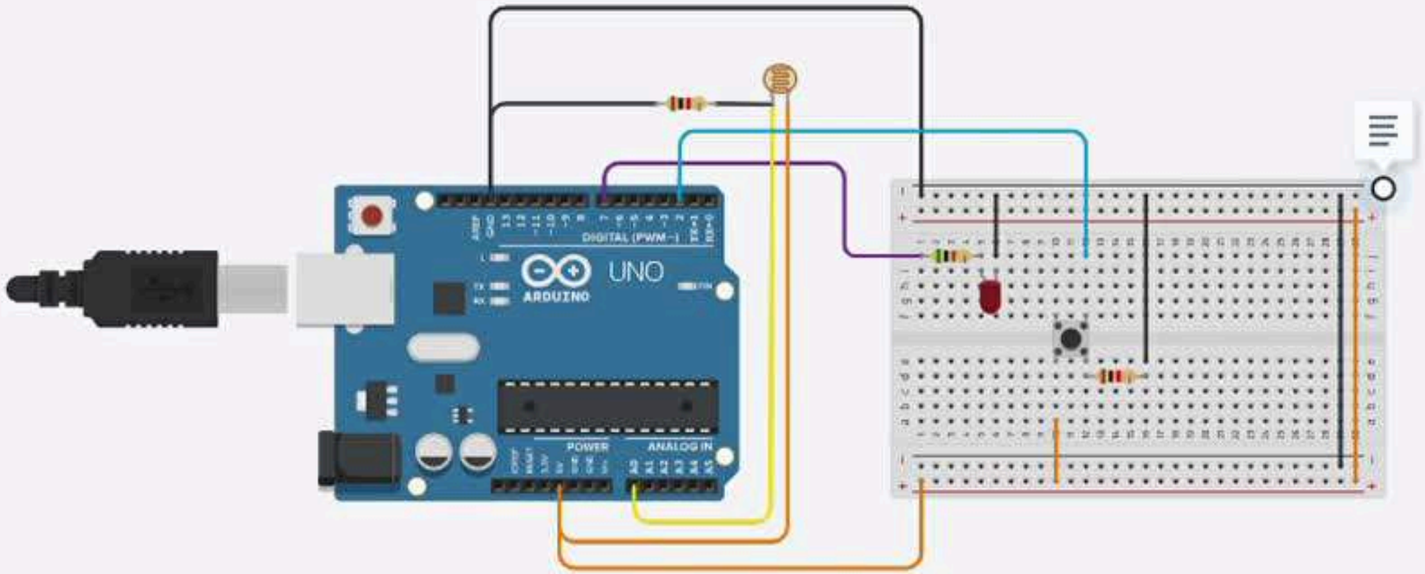
Circuit design Copy of Light Se

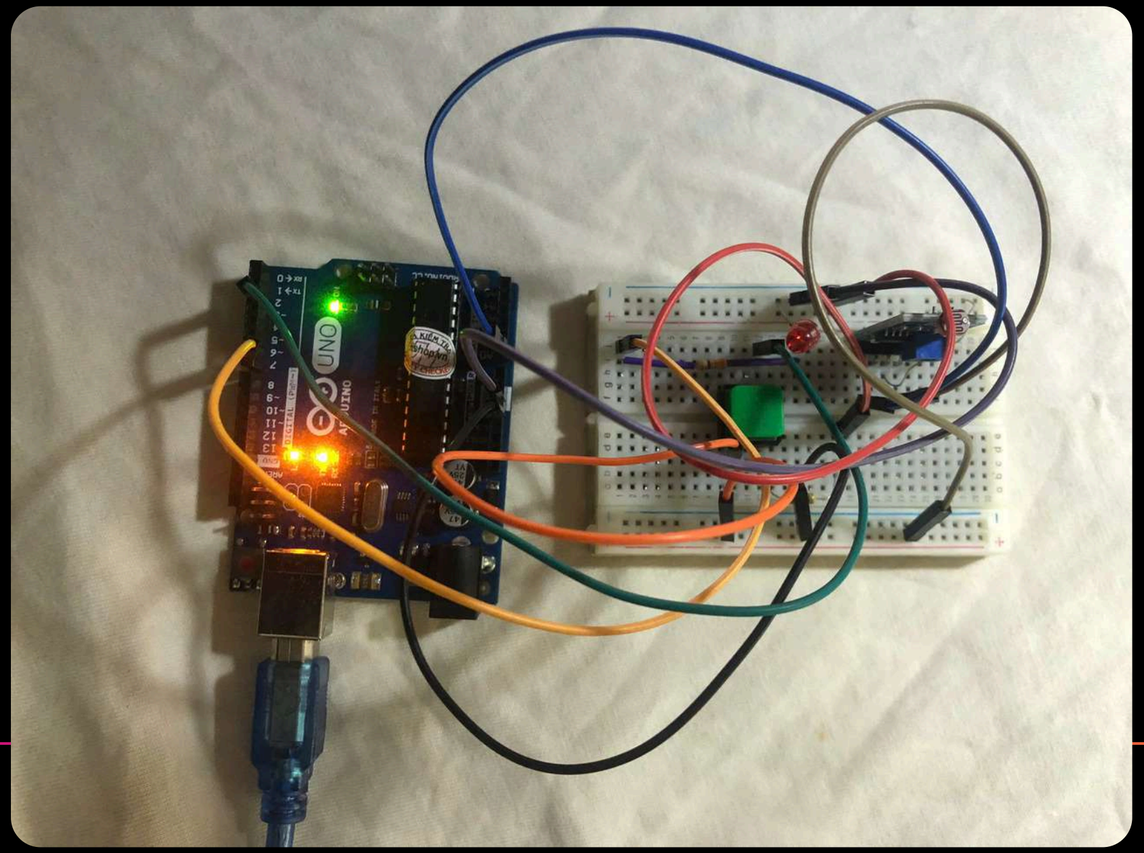
tinkercad.com/things/1TP51eW1kF0/editel

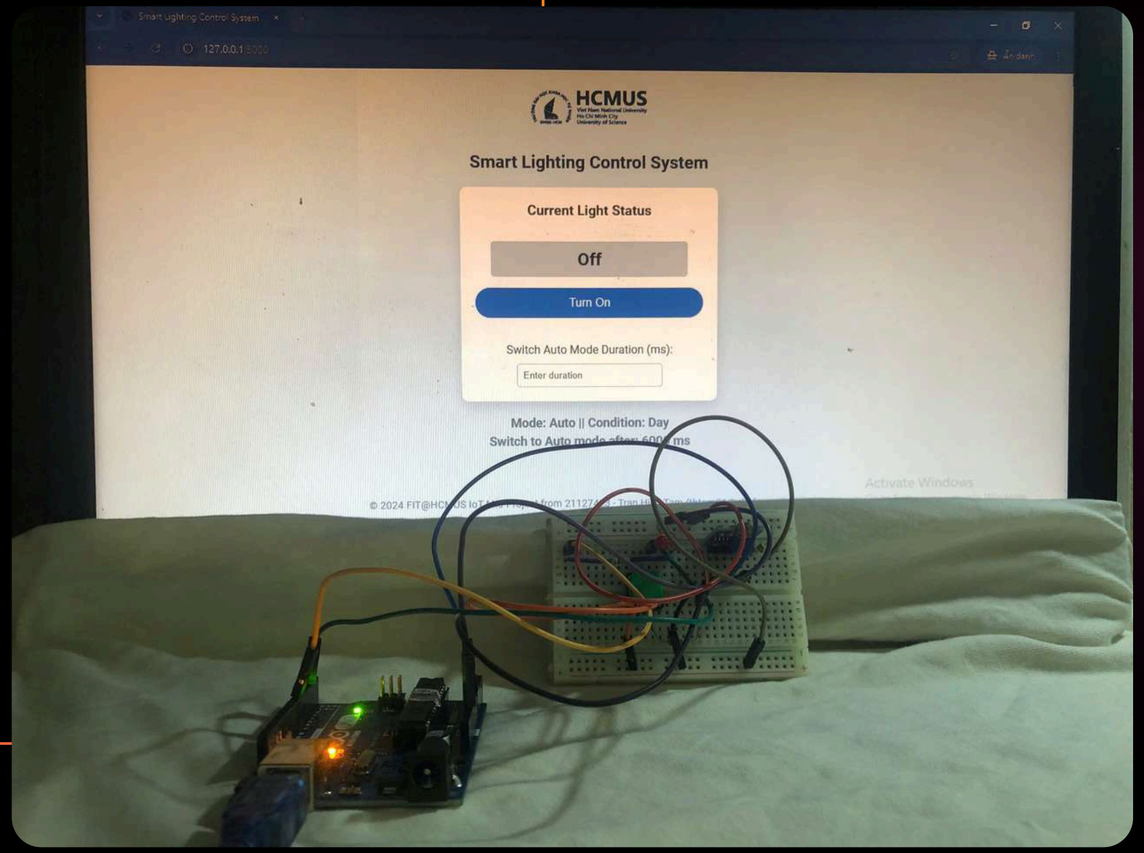
21127423 - Smart Lighting Control System

All changes saved

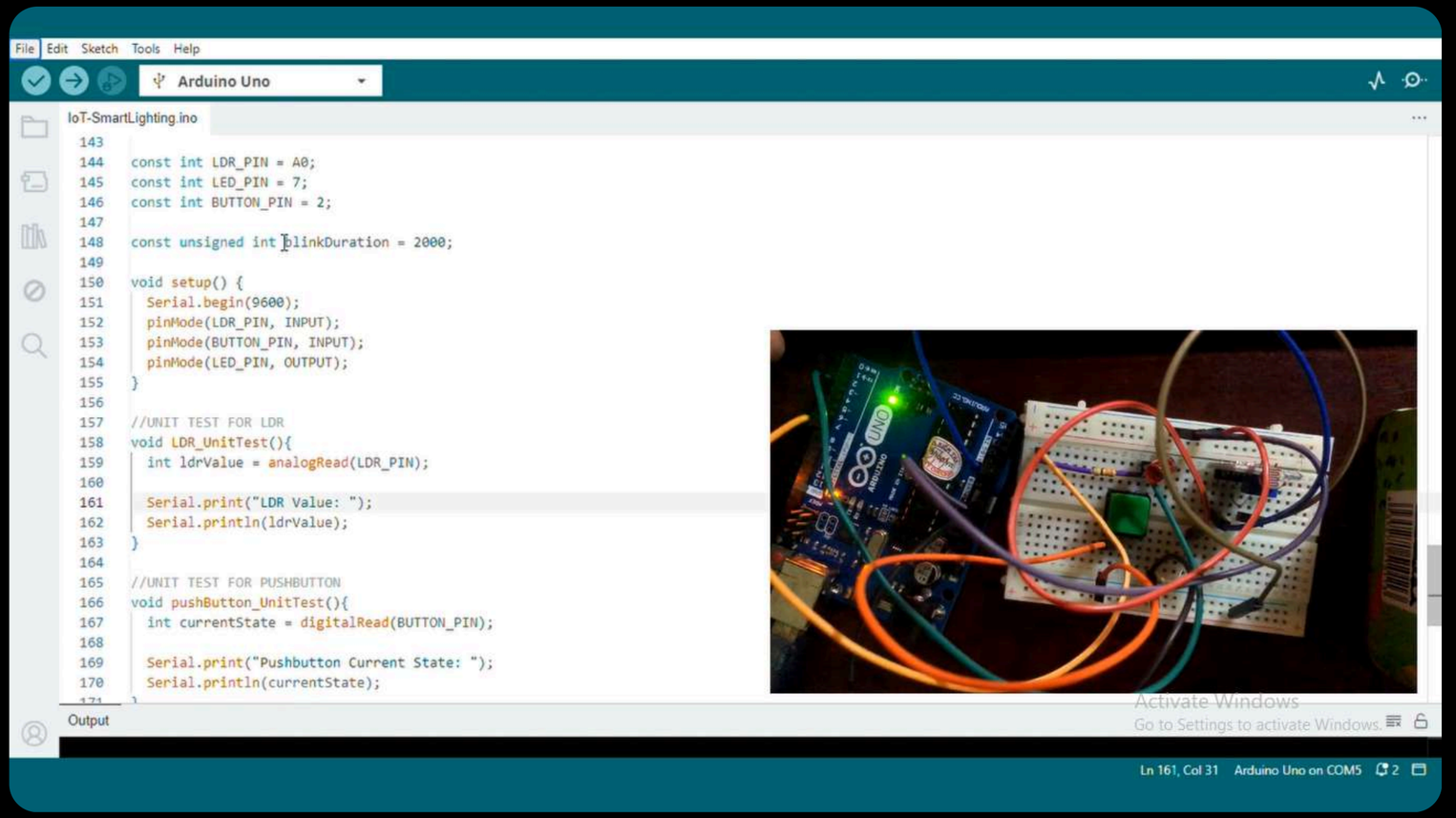
Code | Initializing... | Send To







Smart Lighting Control System Complete Demonstration on Real Hardware



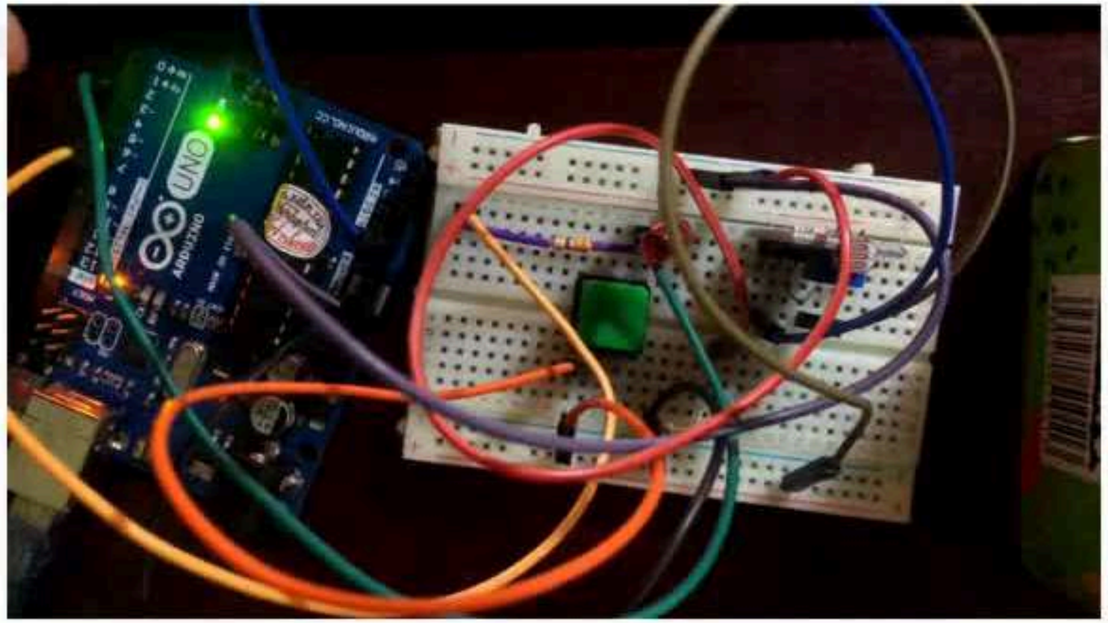
Unit Test on Real Hardware System

File Edit Sketch Tools Help

Arduino Uno

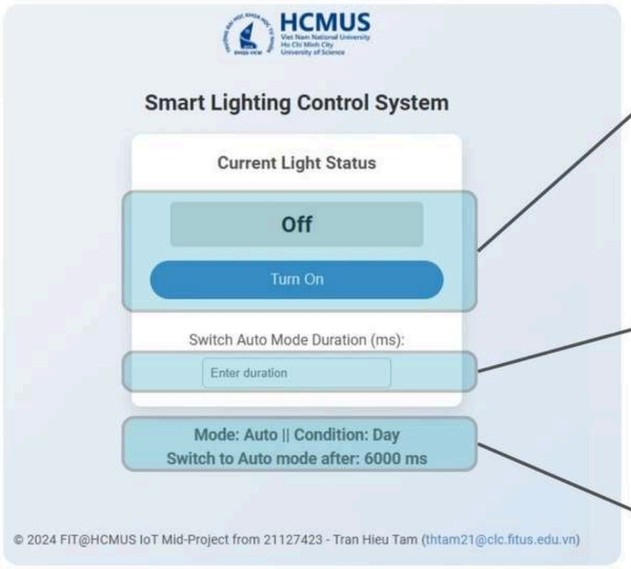
IoT-SmartLighting.ino

```
170   Serial.println(currentState);
171 }
172
173 //UNIT TEST FOR Blinking LED
174 void blinkingLED_UnitTest(){
175   digitalWrite(LED_PIN, (millis() % blinkDuration < (blinkDuration / 2))? HIGH : LOW);
176   Serial.println("LED is currently blinking.");
177 }
178
179 void loop() {
180   LDR_UnitTest();
181   // pushButton_UnitTest();
182   // blinkingLED_UnitTest();
183
184   delay(200);
185 }
186
187
188 /*
189 Format dữ liệu gửi từ Arduino tới Website
190 "<timeout>,<is_DayCondition>,<is_autoMode>,
191 <is_blinking>,<is_LED_ON>\n"
192
193 ----------------------------------------
194 Format dữ liệu gửi từ Website tới Arduino
195 "<timeout>,<is_pressedButton>\n"
196
197 */
```

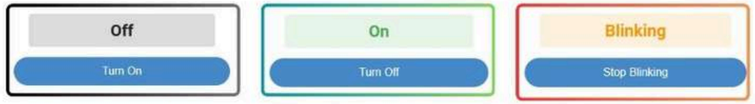


Output

Ln 180, Col 13 Arduino Uno on COM5 2



1. LED Current State & Pushbutton



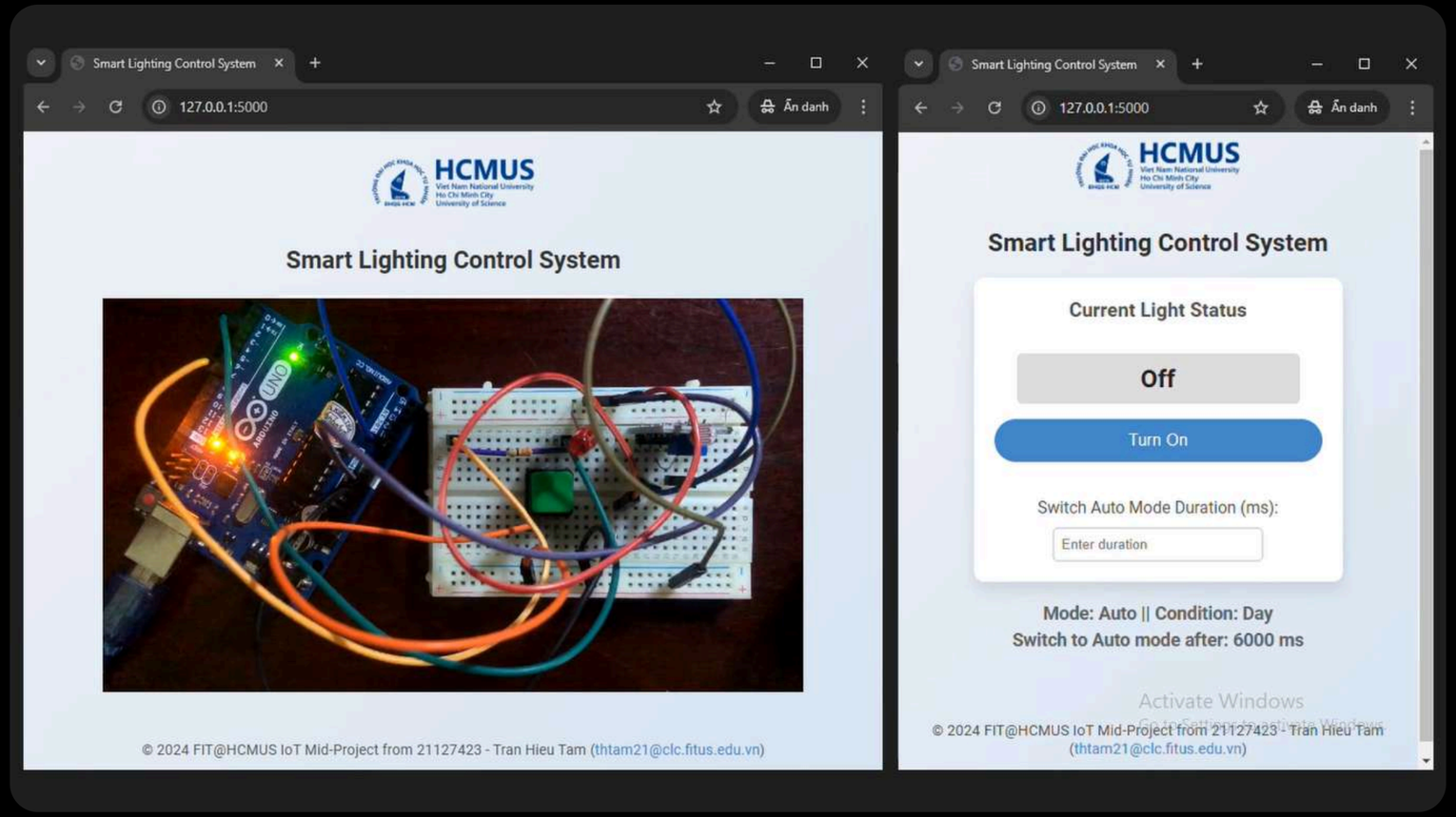
2. Switch Auto Mode Duration (ms)

Từ 1 đến 4,294,967,295 (ms).
Nếu nhập 0 thì bỏ qua điều kiện timeout.

3. System Current State

Mode {Auto, Manual}; Condition {Day, Night};
Switch to Auto mode after [0, 4,294,967,295] (Đơn vị: millisecond)

Web Service GUI



Complete demonstration on real hardware

Smart Lighting Control System

127.0.0.1:5000

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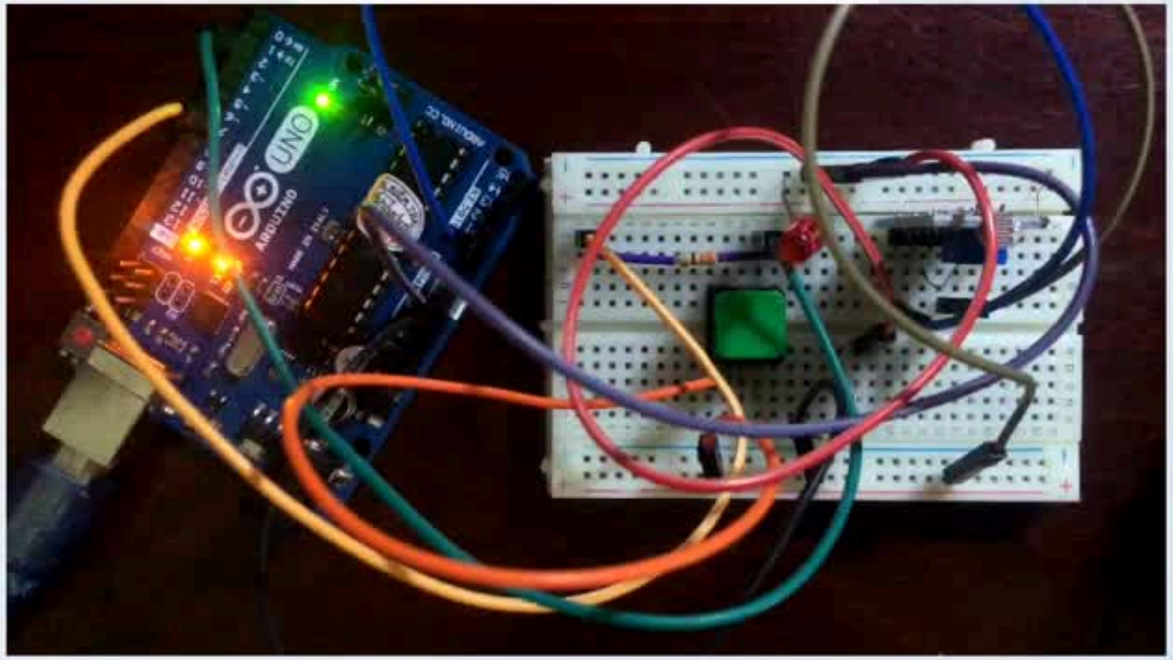
Viet Nam National University
Ho Chi Minh City
University of Science

Smart Lighting Control System



Smart Lighting Control System

127.0.0.1:5000

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Smart Lighting Control System

Current Light Status

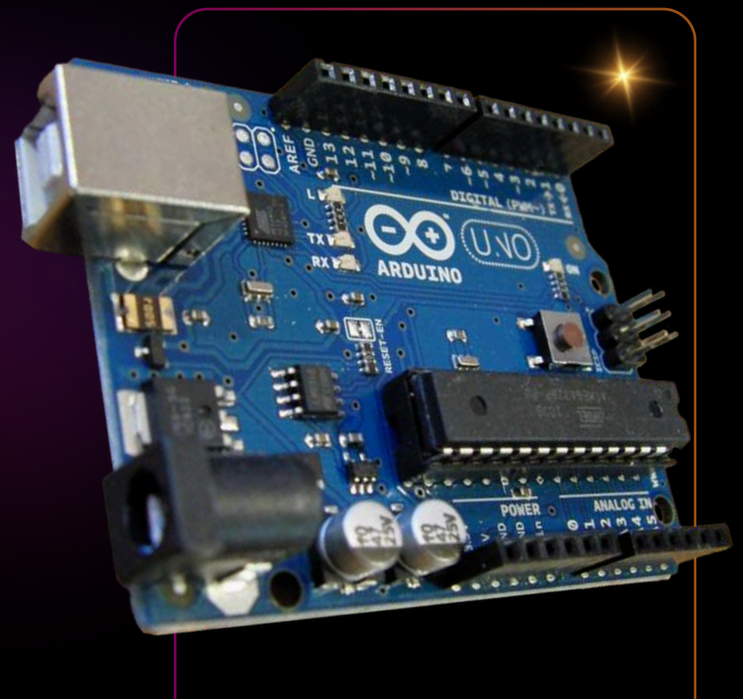
Off

Turn On

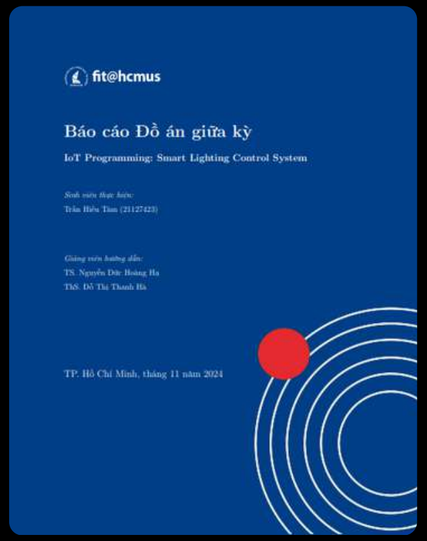
Switch Auto Mode Duration (ms):

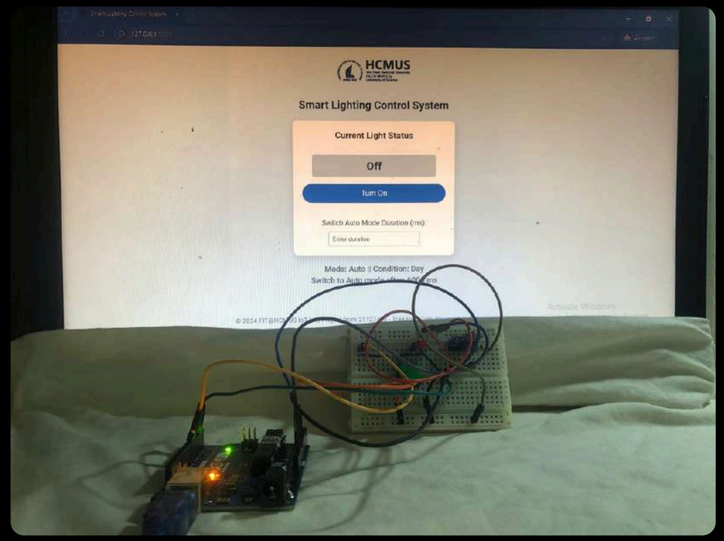
Enter duration

Mode: Auto || Condition: Day
Switch to Auto mode after: 6000 ms

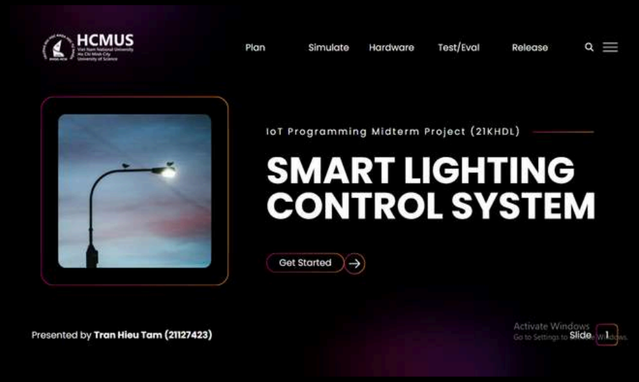


Report

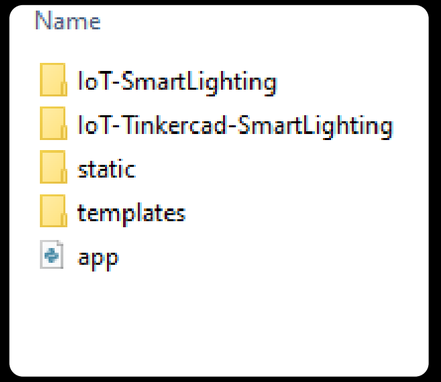




Complete system



Video demonstration



Source code

Thank you for your attetion

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