**Smart Lighting System**

**Introduction**

The Smart Lighting System is designed to control a light automatically based on motion detection and ambient light conditions. It uses an LDR (Light Dependent Resistor) sensor to measure brightness levels and a PIR (Passive Infrared) sensor to detect motion. A slide switch allows users to manually override the system. The system displays real-time status updates on an LCD screen.

When the ambient light is low and motion is detected, the system turns the light ON. If no motion is detected for 5 seconds, the system turns the light OFF. If the environment is already bright, the light remains OFF to conserve energy.

**System Functionality**

The system operates in two modes based on the slide switch position:

**Automatic Mode (Slide Switch OFF)**

* If the room is dark (LDR value ≤ 100) and motion is detected, the light turns ON and the LCD displays "MOTION DETECTED - LIGHT ON."
* If no motion is detected for 5 seconds, the light turns OFF, and the LCD displays "NO MOTION - TURNING OFF."
* If the room is bright (LDR value > 100), the light remains OFF, and the LCD displays "ENOUGH LIGHT - TURNING OFF."

**Manual Mode (Slide Switch ON)**

* The light remains ON continuously, ignoring sensor readings.
* The LCD first displays "LIGHT ON" and then updates to "SMART SYSTEM OFF."

**Conclusion**

The Smart Lighting System ensures efficient energy usage by activating lights only when needed. Future improvements could include Wi-Fi or Bluetooth connectivity, adjustable delay settings, and adaptive brightness control.T his system can be used in contained spaces such as bathrooms, public toilets etc.,The duration till which the light is kept on is 5 seconds as per the code…It can be changed as per required..This time is given to take care the case if the person is still there but not in motion..