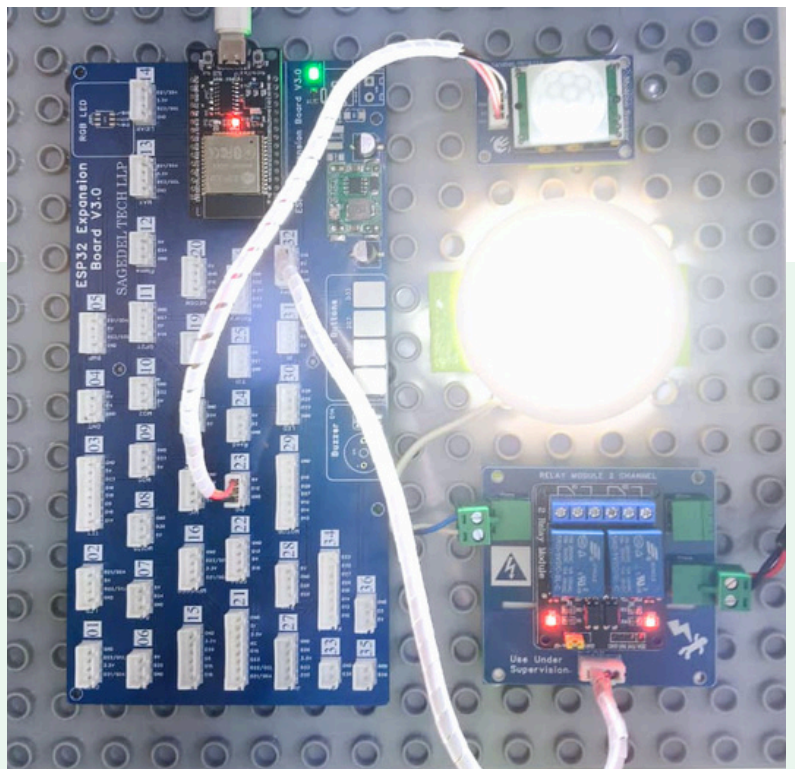


PIR MOTION DETECTION LIGHTING SYSTEM

PIR Motion Detection Lighting System — Smart Automatic Light Control

2026



PIR MOTION
DETECTION



RELAY MODULE

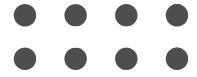


LIGHTING
SYSTEM



PIR MOTION DETECTION LIGHTING SYSTEM

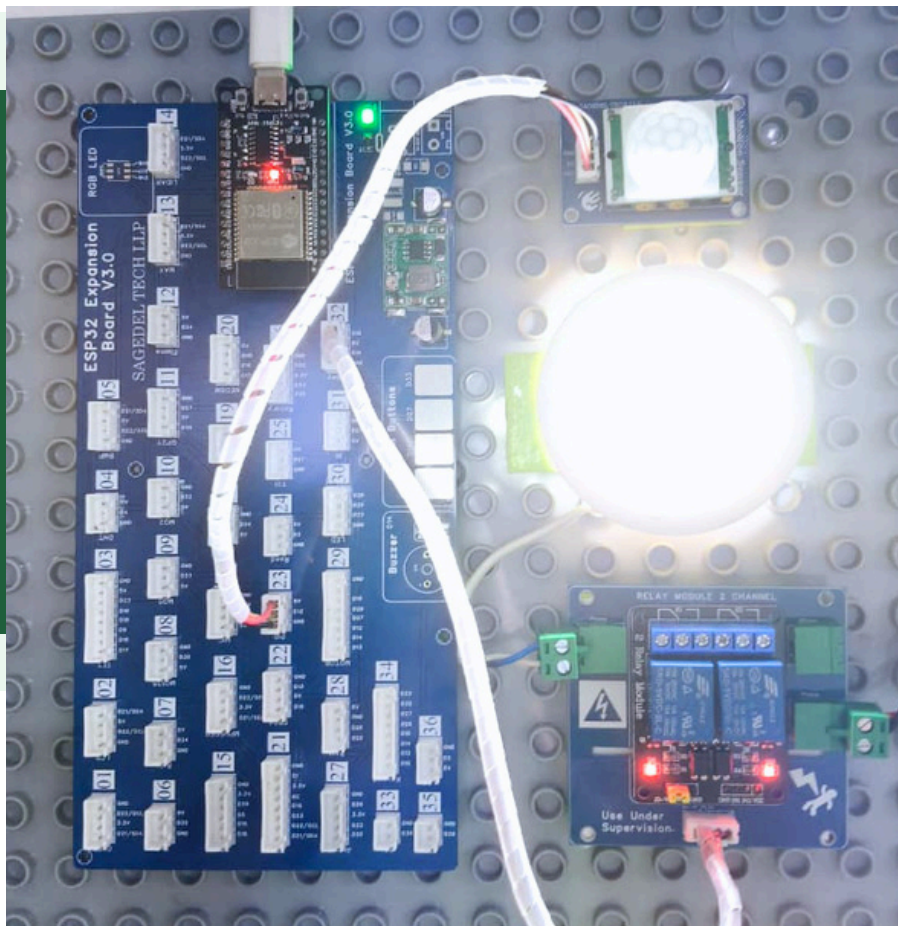
Objective:

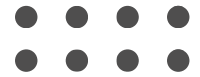


Learn how to use a PIR motion sensor and relay module to automatically switch lights ON or OFF based on human movement.

What it Does:

The PIR Motion Detection Lighting System detects human movement using a Passive Infrared (PIR) sensor and automatically switches the connected lights ON when motion is detected. When no movement is detected for a period of time, the system turns the lights OFF, helping conserve energy and providing convenient, automatic lighting control.





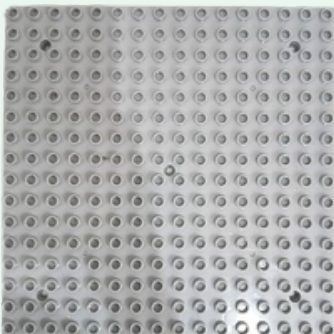
Modules & Components used:



ESP32 Expansion Board



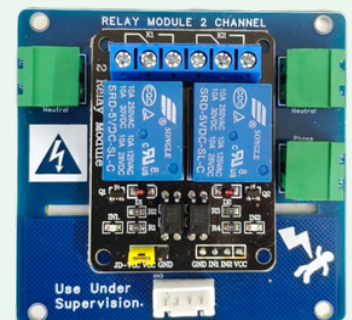
Power Cord



Lego Board



Motion Sensor



2 Channel Relay Module



JST Cables

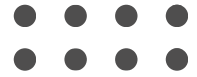


USB Cable



5W AC LED Light

Step-by-Step Assembly & Connections

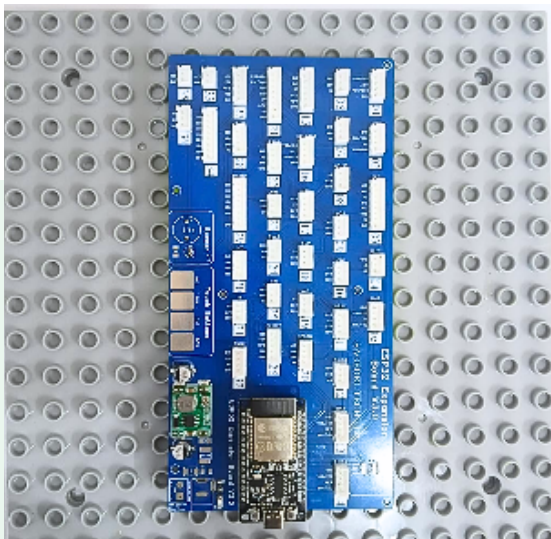


Step 1: Place the PIR Motion Sensor on the desired detection area. Connect the port no.23

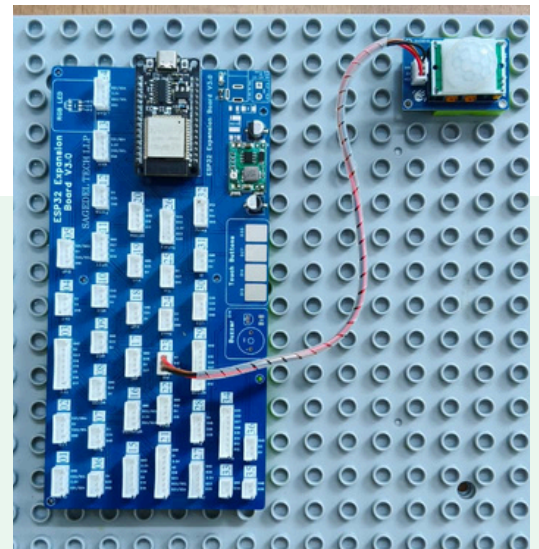
Step 2: Mount the 2-Channel Relay Module beside the ESP32. Connect the port no.32

Step 3: Connect the lights to the relay module through the COM and NO terminals, ensuring the Neutral wire is connected directly to the lights.

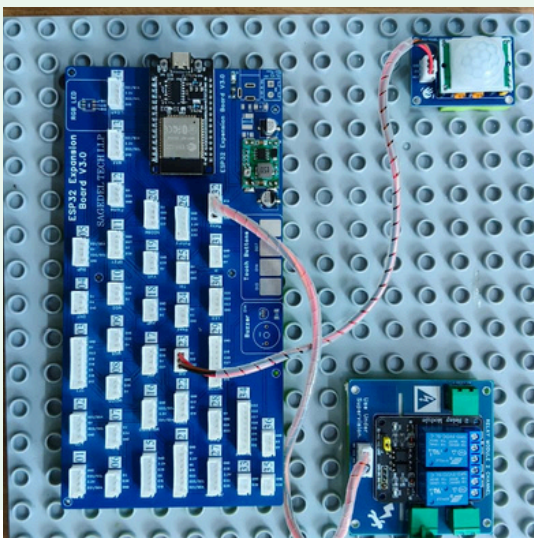
Step 4: Upload the program to the ESP32 and power the system. The lights turn ON when motion is detected and OFF when no motion is detected.



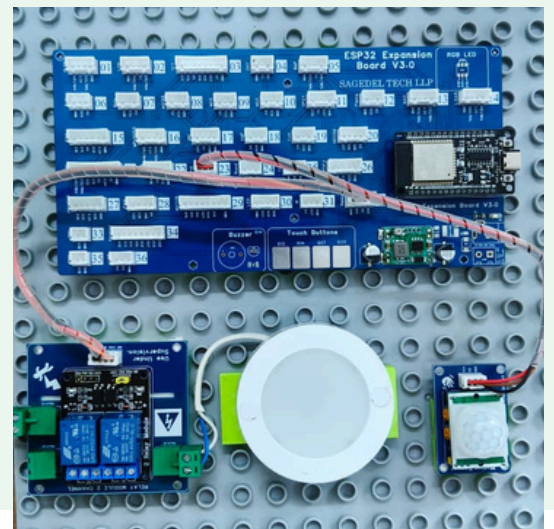
Step 1:



Step 2:



Step 3:

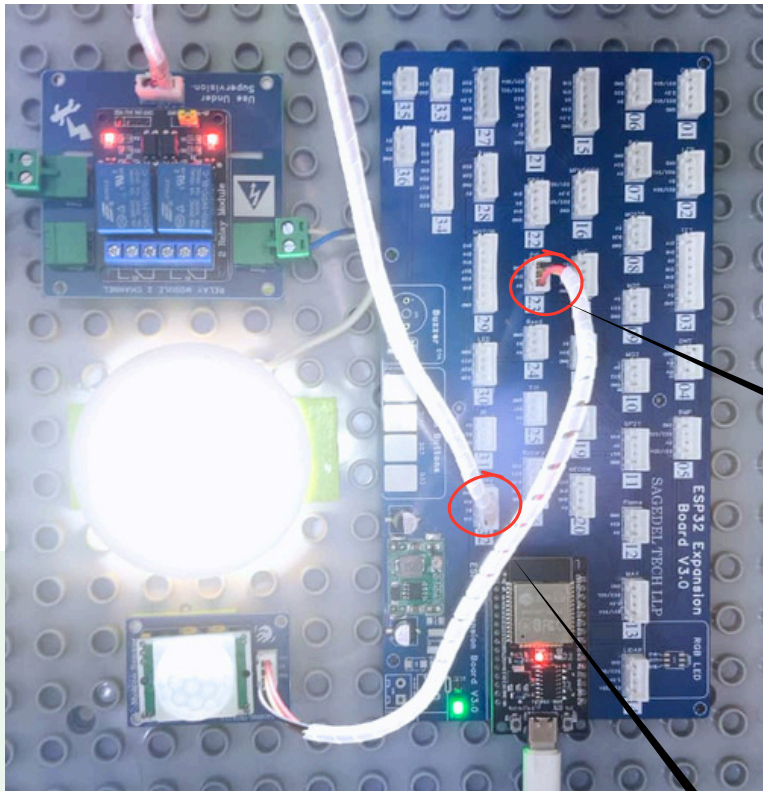


Step 4:

Specific Port Connections



- **PIR SENSOR** → Connect it to **Port No. 23**
- **RELAY MODULE** → Connect it to **Port No. 32**

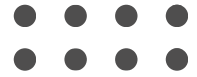


Connect the PIR sensor to Port No. 23

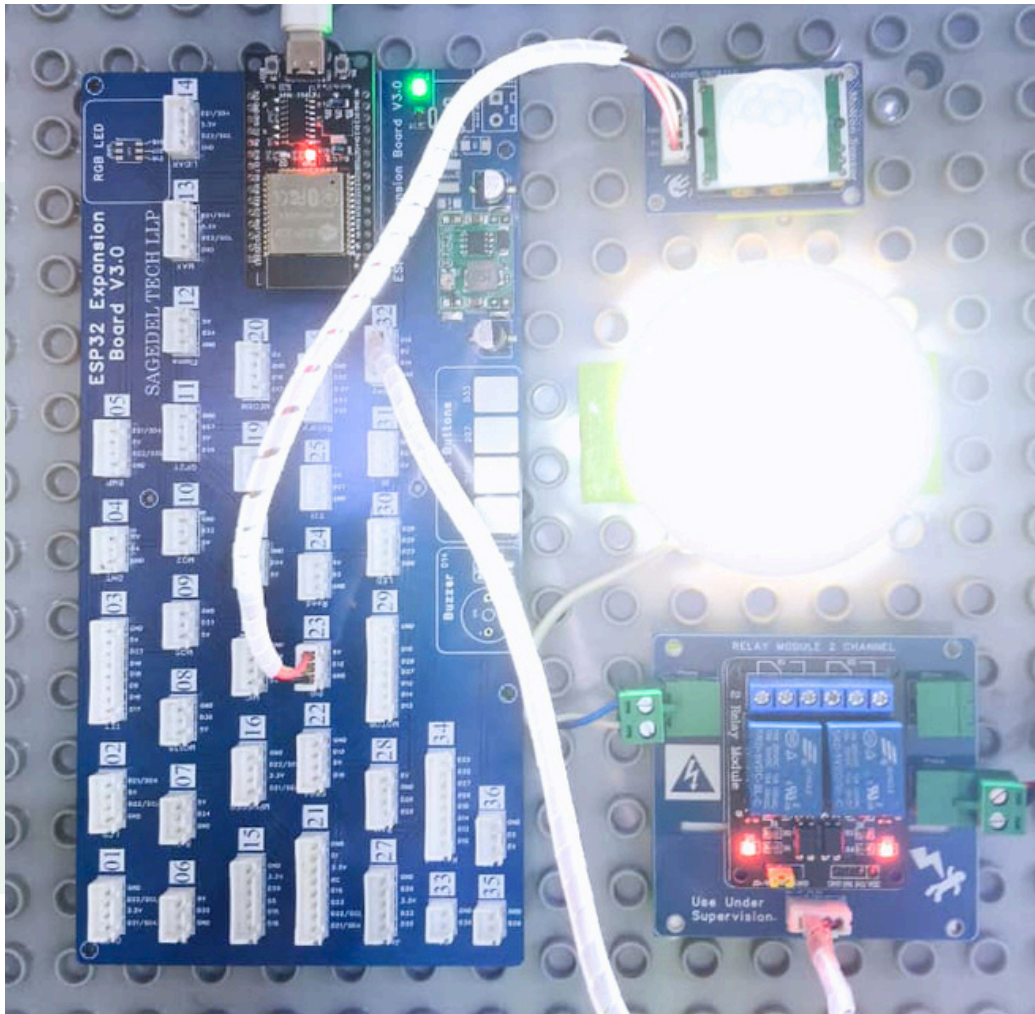


Connect the 2-Channel Relay Module to Port No. 32

Final Cable Management



- Bundle all loose wires neatly using spiral wraps or cable ties, keeping them secured flat against the baseplate.



Calibration:

Power on the system and wait for the PIR sensor to complete its initialization. Test the sensor by moving within its detection range and confirm that the connected lights respond correctly.