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REGISTRATION NUMBER:22BMM0008

MID-COURSE PROJECT

1.AIM:

To simulate a smart intrusion detection system in Wokwi such that it:
(a) continuously detects human movement in a restricted area using a PIR sensor,
(b) provides real-time alerts to security personnel via the cloud when motion is detected, indicating unauthorized access.

2.PROBLEM STATEMENT:

The growing need for effective and responsive home security systems calls for smart intrusion detection solutions that can be remotely monitored and controlled. Traditional systems lack real-time alerts, automation, and integration with cloud-based platforms. This project aims to simulate a **Smart Intrusion Detection System** using **Wokwi** (a virtual electronics simulator) integrated with **Blynk Cloud**, enabling remote notifications and real-time control via a smartphone app. The system leverages a **PIR motion sensor**, **LED**, **buzzer**, **relay**, and **servo motor** to detect motion and respond actively, simulating real-world security scenarios.

3.SCOPE OF THE SOLUTION:

A. **Scalability to Smart Home Ecosystems:**

- Integration with other IoT devices such as cameras, door sensors, or smart locks.
- Expansion into multi-sensor, multi-zone security systems.

B. **Advanced Cloud Analytics & AI Integration:**

- Use of machine learning for behaviour-based intrusion detection.
- Cloud-based analytics dashboards for activity logs and pattern recognition.

C. **Cross-platform Compatibility:**

- Support for multiple IoT platforms (e.g., Home Assistant, Node-RED, IFTTT).

D. **Real-time Automation & Notifications:**

- Faster and more customizable alerts via SMS, push notifications, or emails.
- Event-triggered automation (e.g., turning on lights or locking doors).

E. **Energy-efficient and Sustainable Design:**

- Simulation of low-power designs for real-world deployment in off-grid or solar-powered setups.

4.REQUIRED COMPONENTS OF THE SOLUTION:

A.ESP 32 Board

B. A Standard Micro Servo Motor

C. Electrically operated switch

D. A piezoelectric buzzer

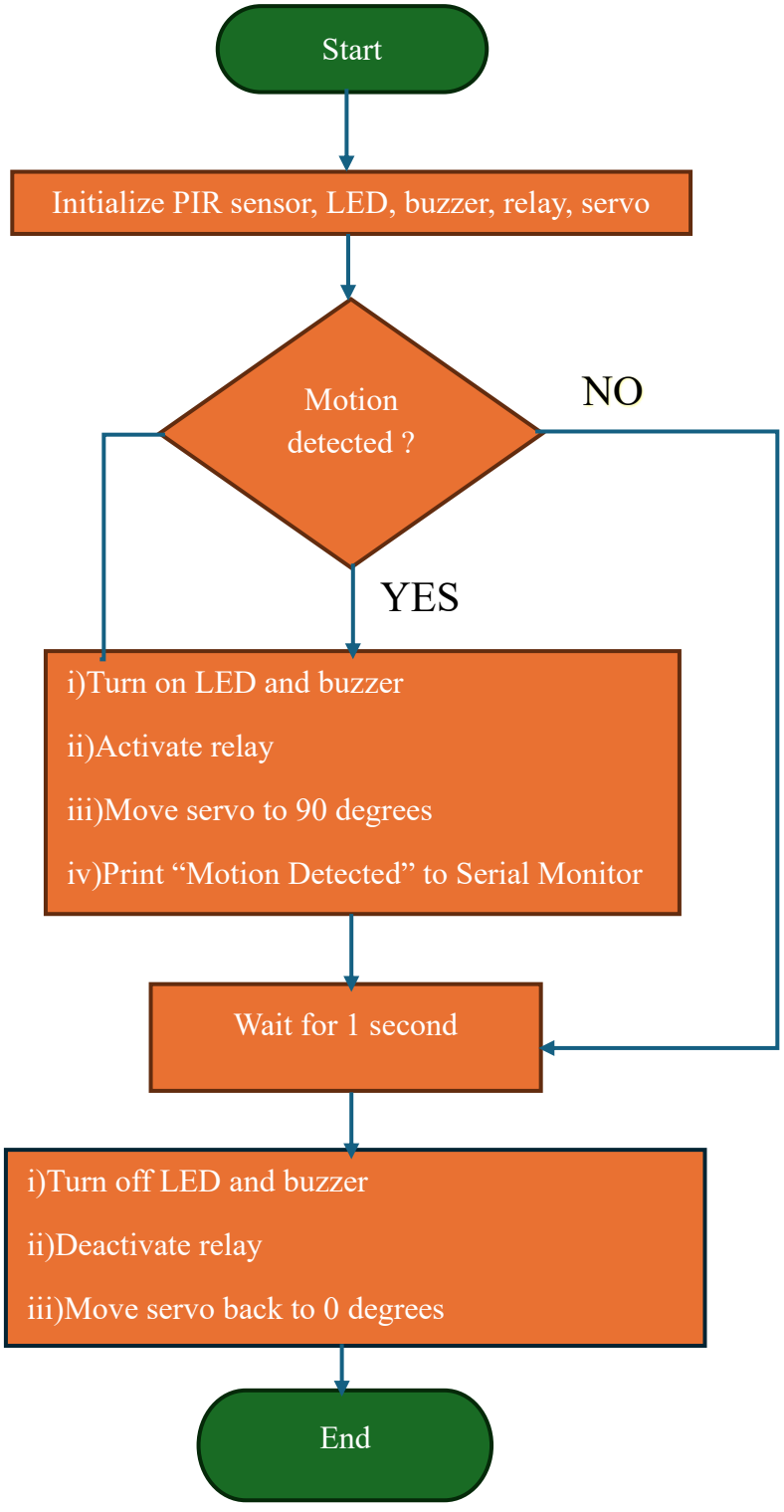
E. Passive Infrared (PIR) motion sensor

F. 2 Standard 5mm LEDs.

G. Connecting Wires

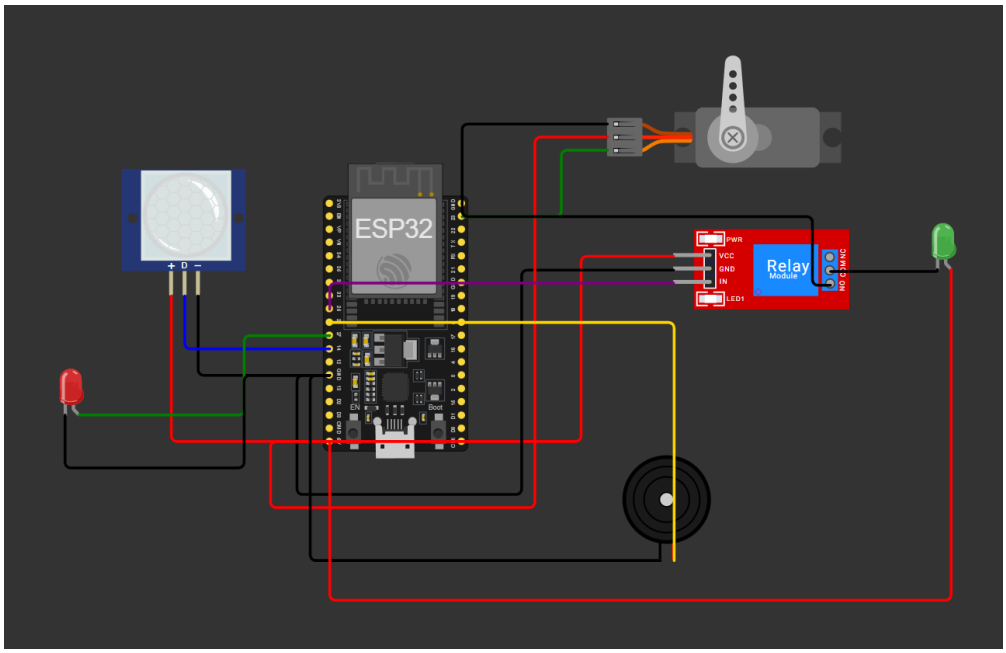
H. Blynk platform is used as cloud environment

5.FLOWCHART OF THE CODE:

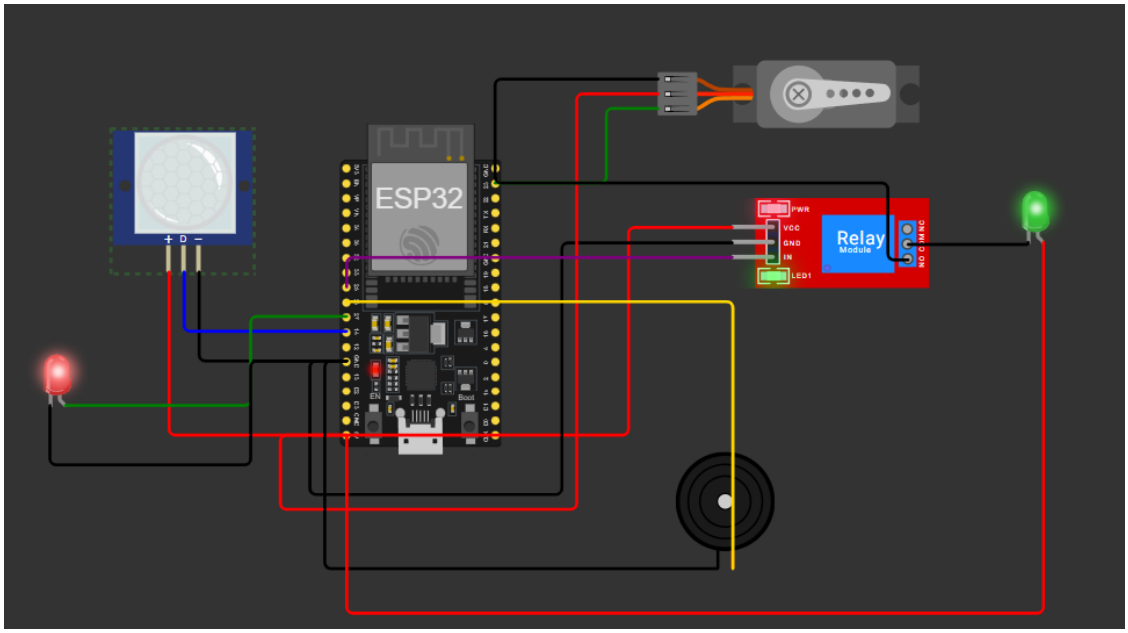


6.SIMULATED CIRCUIT:

Before Movement Detection:



After Movement Detection:



7.LINK FOR GITHUB REPOSITORY: