**Hostel attandence system:**

**Project Goal:**

* Monitor the number of people inside a hostel room.
* If less than **4 members** are detected **between 9 PM and 6 AM**, a notification alert is sent via **Blynk**.
* Member count is displayed live in the Blynk app.

**Step 1: Components Required**

| **Component** | **Quantity** |
| --- | --- |
| ESP32 | 1 |
| IR Sensor (Reflective) | 1 or more |
| Jumper Wires | As needed |
| Breadboard | Optional |

**Step 2: Circuit Connections**

| **IR Sensor Pin** | **ESP32 Pin** |
| --- | --- |
| VCC | 3.3V |
| GND | GND |
| OUT | GPIO 13 |

**Step 3: Blynk Cloud Setup**

1. Go to <https://blynk.cloud>  
   Login or Sign Up.
2. Go to **Templates → + New Template**
   * **Name:** attandence
   * **Board:** ESP32
   * **Connection:** WiFi
3. Add **Datastreams**:

| **Name** | **Type** | **Virtual Pin** |
| --- | --- | --- |
| Member Count | Integer | V0 |

1. Go to **Events → + Add Event**
   * **Name:** low\_member\_alert
   * **Message:** "Room 101: Only {value} members detected."
   * Enable **Push Notification**
2. Click **"Search Devices → Add Device From Template"**
3. Copy these:
   * BLYNK\_TEMPLATE\_ID
   * BLYNK\_TEMPLATE\_NAME
   * BLYNK\_AUTH\_TOKEN

**📱 Step 4: Blynk App Setup (Mobile)**

1. Open **Blynk IoT App**
2. Tap your device > Edit
3. Add a **Label** widget

# Set to **V0** to display **member count**

1. Save the layout

**Step 5: Arduino IDE Setup**

**Install Libraries:**

* Blynk (from Library Manager)
* WiFi
* time.h (comes by default)

**Update Code WiFi Credentials:**

cpp

CopyEdit

char ssid[] = "Wokwi-GUEST"; // or your WiFi name

char pass[] = ""; // or your WiFi password

**Step 6: How the Code Works**

* Every **2 seconds**, it checks the **IR sensor**.
* If it detects someone **leaving** (IR triggered), it **decreases memberCount**.
* From **9:00 PM to 6:00 AM**, if memberCount < 4, it triggers a **Blynk alert** once.
* Member count is sent to the Blynk app via V0.

**Step 7: Upload and Monitor**

1. Select **Board:** ESP32 Dev Module
2. Select **Port:** COM port of your ESP32
3. Click **Upload**
4. Open **Serial Monitor** to see the debug log
5. Open **Blynk App** → see real-time member count

**Logic Assumptions**

* memberCount starts at 4 (you can change it to 0 and increment if using two IR sensors to count both in and out).
* This code only **reduces** count. For accurate counting of entry and exit, use **2 IR sensors**.

**Code for the project:**

#define BLYNK\_TEMPLATE\_ID "TMPL3dM27L4OW"

#define BLYNK\_TEMPLATE\_NAME "attandence"

#define BLYNK\_AUTH\_TOKEN "mBRe16AUFuCenokQr3S087gRTDR9RY6H"

#include <WiFi.h>

#include <BlynkSimpleEsp32.h>

#include <time.h>

char ssid[] = "Wokwi-GUEST";

char pass[] = "";

#define IR\_SENSOR 13

int memberCount = 4;

bool lastState = HIGH;

unsigned long previousMillis = 0;

const unsigned long interval = 2000;

bool alertSent = false;

void setup() {

  Serial.begin(115200);

  pinMode(IR\_SENSOR, INPUT\_PULLUP);

  Blynk.begin(BLYNK\_AUTH\_TOKEN, ssid, pass);

  configTime(19800, 0, "pool.ntp.org");

}

void loop() {

  Blynk.run();

  unsigned long currentMillis = millis();

  if (currentMillis - previousMillis >= interval) {

    previousMillis = currentMillis;

    time\_t now = time(nullptr);

    struct tm \*t = localtime(&now);

    int hour = t->tm\_hour;

    bool currentState = digitalRead(IR\_SENSOR);

    if (currentState == LOW && lastState == HIGH) {

      if (memberCount > 0) memberCount--;

    }

    lastState = currentState;

    Serial.print("Room 101 - Members: ");

    Serial.println(memberCount);

    Blynk.virtualWrite(V0, memberCount);

    if ((hour >= 21 || hour < 6) && memberCount < 4) {

      if (!alertSent) {

        Blynk.logEvent("low\_member\_alert", "Room 101: Only " + String(memberCount) + " members detected.");

        alertSent = true;

      }

    } else {

      alertSent = false;

    }

  }

}

