**🔁 ESP32 BLE/WiFi Setup State Machine**

**🟥 State 1: Initial Setup**

* **Conditions**:
  + BLE\_FLAG = 1
  + RESTART\_FLAG = 1
* **Actions**:
  + Connect to BLE.
  + Receive Wi-Fi credentials from BLE.
  + Store the credentials in non-volatile memory (Preferences or NVS).
  + Update flags:
    - BLE\_FLAG = 0
    - RESTART\_FLAG = 1
  + Call ESP.restart();
* **Next State**: → **State 2**

**🟧 State 2: MQTT & JSON Setup**

* **Conditions**:
  + BLE\_FLAG = 0
  + RESTART\_FLAG = 1
* **Actions**:
  + Fully Deinit BLE credentials setup.
  + Use stored Wi-Fi credentials to connect to Wi-Fi.
  + Connect to MQTT broker.
  + Store received JSON (rules/config) in non-volatile memory.
  + Update flags:
    - BLE\_FLAG = 1
    - RESTART\_FLAG = 0
  + Call ESP.restart();
* **Next State**: → **State 3**

**🟩 State 3: Normal Operation**

* **Conditions**:
  + BLE\_FLAG = 1
  + RESTART\_FLAG = 0
* **Actions**:
  + Continue normal operation.
  + BLE stays connected for monitoring/control.
  + If user modifies rules/config:
    - Controller B will be restarted to apply changes. (Sensor unit will also be restarted)
    - Before restart sensor unit:
      * Set:
        + BLE\_FLAG = 1
        + RESTART\_FLAG = 1
      * Call ESP.restart();
      * → Back to **State 1**