		
Laboratory 5: Creating a Smart Home Dashboard in Home Assistant (Lovelace UI)	School of Applied Digital Technology	
Name: Name:	ID: ID:	Section: Section:
Date:	Due date:	

Objectives

- Learn how to design a Lovelace Dashboard to visualize real-time sensor data.
- Understand how to use various Lovelace cards such as Entities, Graph, Gauge, and Button.
- Practice integrating data from sensors and actuators to build an interactive Smart Home UI.

Equipment and Software

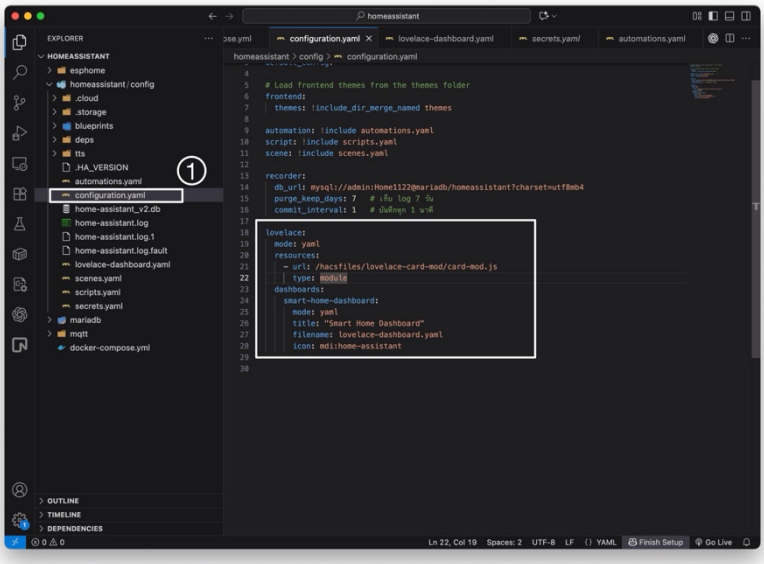
Item	Description
Computer	Running Docker
Home Assistant (Container)	Core system for Smart Home dashboard
ESP32 / ESP8266	Microcontroller board for sensor data
DHT11 / DHT22	Temperature and humidity sensor
MQ-2 Gas Sensor	Detects smoke and gas
LDR Sensor	Measures light intensity
PIR Motion Sensor (HC-SR501)	Detects motion
Buzzer / Fan / LED	Actuators controlled via GPIO or relay

1. Enable YAML Mode for Lovelace Dashboard

- Edit the file configuration.yaml in your /config/ directory and add:

Yaml :

```
lovelace:
  mode: yaml
  resources:
    - url: /hacsfiles/lovelace-card-mod/card-mod.js
      type: module
  dashboards:
    smart-home-dashboard:
      mode: yaml
      title: "Smart Home Dashboard"
      filename: lovelace-dashboard.yaml
      icon: mdi:home-assistant
```



💡 Note:

- Restart Home Assistant after editing.
- The dashboard file lovelace-dashboard.yaml will be created and stored in /config/.

- The dashboard name must contain a hyphen (-) instead of an underscore (_).

  Example: ✅ smart-home-dashboard

  ❌ smart_home_dashboard

- After saving, go to

  Settings ⟶ Developer Tools ⟶ YAML ⟶ Check Configuration and then click Restart if no errors appear.

2. Create the Dashboard File

- Create a new file named lovelace-dashboard.yaml in the /config/ directory.
- Paste the code below:

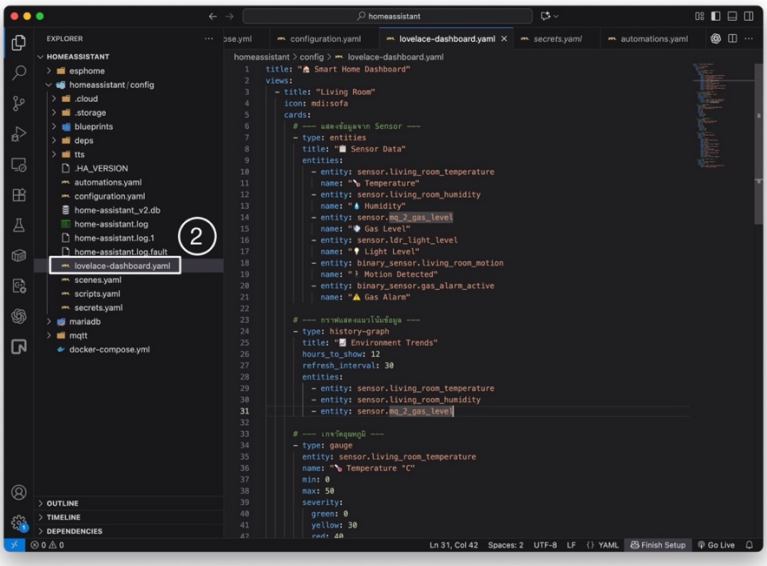
Yaml:

```
title: "🏠 Smart Home Dashboard"
views:
  - title: "Living Room"
    icon: mdi:sofa
    cards:
      # --- Sensor Data ---
      - type: entities
        title: "📋 Sensor Data"
        entities:
          - entity: sensor.living_room_temperature
            name: "🌡️ Temperature"
          - entity: sensor.living_room_humidity
            name: "💧 Humidity"
          - entity: sensor.mq_2_gas_level
            name: "💨 Gas Level"
```

```
    - entity: sensor.ldr_light_level
      name: " 💡 Light Level"
    - entity: binary_sensor.living_room_motion
      name: " 🚶 Motion Detected"
    - entity: binary_sensor.gas_alarm_active
      name:"⚠️ Gas Alarm"

# --- Historical Graphs ---
- type: history-graph
  title: "📈 Environment Trends"
  hours_to_show: 12
  refresh_interval: 30
  entities:
    - entity: sensor.living_room_temperature
    - entity: sensor.living_room_humidity
    - entity: sensor.mq_2_gas_level

# --- Temperature Gauge ---
- type: gauge
  entity: sensor.living_room_temperature
  name: " 🌡️ Temperature °C"
  min: 0
  max: 50
  severity:
    green: 0
    yellow: 30
    red: 40
```

```
# --- Light Level Gauge ---
- type: gauge
  entity: sensor.ldr_light_level
  name: "💡 Light Level (V)"
  min: 0
  max: 3.3
  severity:
    red: 0.5
    yellow: 1.0
    green: 2.0

# --- Device Controls ---
- type: grid
  title: "🔧Device Controls"
  columns: 3
  cards:
    - type: button
      entity: fan.living_room_fan
      name: "Fan"
      icon: mdi:fan
      tap_action: { action: toggle }
    - type: button
      entity: switch.active_buzzer
      name: "Buzzer"
      icon: mdi:volume-high
      tap_action: { action: toggle }
    - type: button
```

```
      entity: switch.indicator_led
      name: "LED"
      icon: mdi:led-on
      tap_action: { action: toggle }

  # --- Map (for Lab 9) ---
  - type: map
    title: " 📍 Sensor Location"
    default_zoom: 15
    entities:
      - entity: sensor.living_room_temperature
        name: "Living Room Sensor"
```



3. Add Automations for Device Control

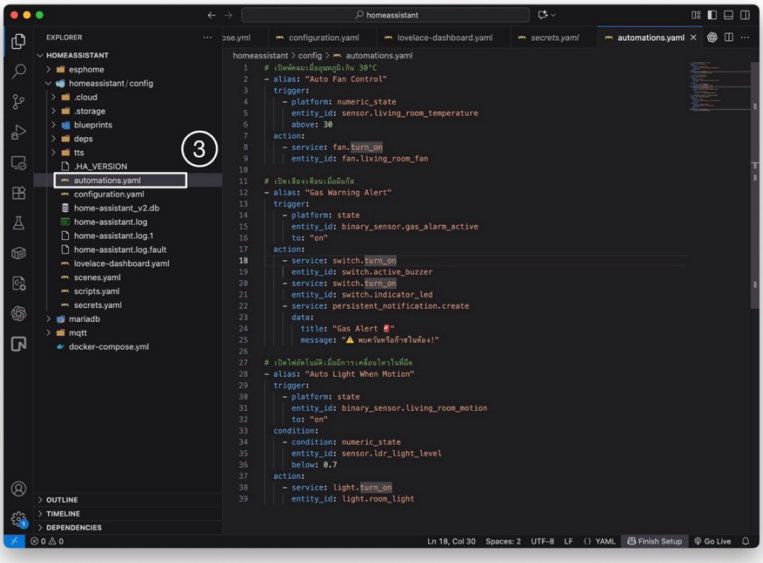
- Edit /config/automations.yaml and add:

Yaml:

```
# Turn on the fan when temperature exceeds 30°C
```

```
- alias: "Auto Fan Control"
  trigger:
    - platform: numeric_state
      entity_id: sensor.living_room_temperature
      above: 30
  action:
    - service: fan.turn_on
      entity_id: fan.living_room_fan


# Turn on buzzer and LED when gas is detected
- alias: "Gas Warning Alert"
  trigger:
    - platform: state
      entity_id: binary_sensor.gas_alarm_active
      to: "on"
  action:
    - service: switch.turn_on
      entity_id: switch.active_buzzer
    - service: switch.turn_on
      entity_id: switch.indicator_led
    - service: persistent_notification.create
      data:
        title: "Gas Alert 🚨"
        message: "⚠️ Gas or smoke detected in the room!"


# Automatically turn on the light when motion detected in darkness
- alias: "Auto Light When Motion"
```

```
trigger:
  - platform: state
    entity_id: binary_sensor.living_room_motion
    to: "on"
condition:
  - condition: numeric_state
    entity_id: sensor.ldr_light_level
    below: 0.7
action:
  - service: light.turn_on
    entity_id: light.room_light
```



4. View the Dashboard

Open:

👉 http://localhost:8123/lovelace/smart-home-dashboard

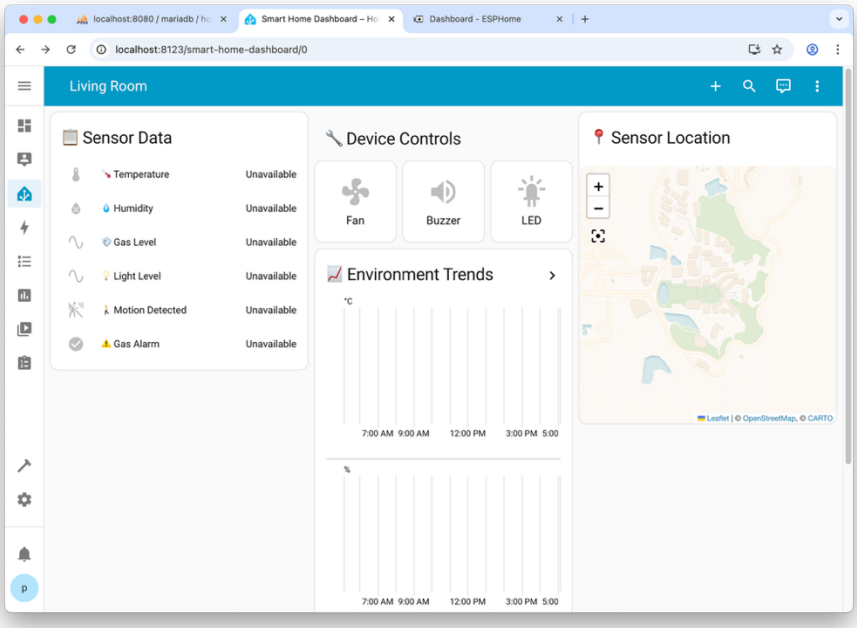
You should see a clean, interactive dashboard containing:

- Real-time sensor readings

• Graphs and gauges

• Control buttons for fan, buzzer, and LED

• A map card (for use in Lab 9)



Take 1: Organize and Add a “Bedroom” View (Bonus Task)

Requirements

1. Add a new view named Bedroom to your existing YAML dashboard.

The view must include:

• One Entities Card showing at least: sensor.bedroom_temperature, sensor.bedroom_humidity, and binary_sensor.bedroom_motion

• At least one Gauge Card (for example, temperature)

• At least one Grid Card with two control buttons (e.g., Light and Buzzer)

2. Organize your dashboard layout for clarity and readability:

• Group cards logically into Sensor Data, Graph/Visualization, and Device Controls sections.

• Use clear titles, icons, and consistent styling for each view (Living Room & Bedroom).

3. (Optional — Bonus) Use card-mod styling or other Lovelace resources to improve spacing or hide unwanted headers.

• Make sure the resource is declared properly under lovelace: resources: in your YAML configuration.

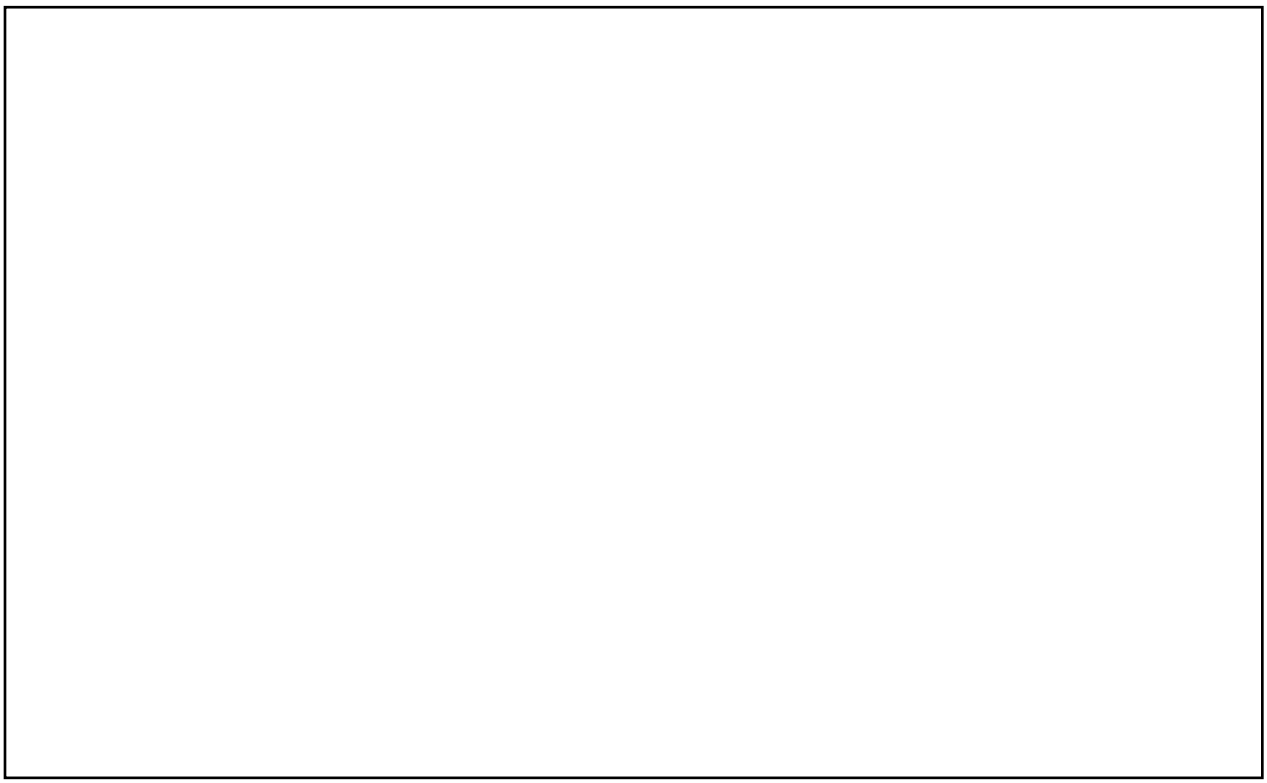
• Restart Home Assistant after updating the configuration.

4. Submission Requirements:

• Paste your updated lovelace-dashboard.yaml containing both Living Room and Bedroom views into a Notepad file.

• Capture and submit screenshots of the Bedroom dashboard showing your entities and control buttons working.

Home Assistant Dashboard:



Continued on the next page.

Code:

----- Have a good day -----

Answer:

```
- title: "Bedroom"
  icon: mdi:bed
  cards:
    - type: entities
      title: "📋 Bedroom Sensor Data"
      entities:
        - entity: sensor.bedroom_temperature
          name: "🌡️ Temperature"
        - entity: sensor.bedroom_humidity
          name: "💧 Humidity"
        - entity: binary_sensor.bedroom_motion
          name: "🚶 Motion"

    - type: gauge
      entity: sensor.bedroom_temperature
      name: "🌡️ Temp °C"
      min: 0
      max: 50
      severity:
        green: 0
        yellow: 30
        red: 40
```

```
- type: grid
  title: "🔧 Bedroom Controls"
  columns: 2
  cards:
    - type: button
      entity: light.bedroom_light
      name: "Light"
      icon: mdi:lightbulb
      tap_action:
        action: toggle
    - type: button
      entity: switch.bedroom_buzzer
      name: "Buzzer"
      icon: mdi:volume-high
      tap_action:
        action: toggle
```