		
Laboratory 7: Location-Based Smart Notification using Telegram + Home Assistant	School of Applied Digital Technology	
Name: Name:	ID: ID:	Section: Section:
Date:	Due date:	

Objectives

- Enable Home Assistant to send Telegram alerts with embedded Google Maps location links.
- Practice using templated automation messages in Home Assistant.
- Allow users to know where an event occurred - e.g., Kitchen, Living Room, Bedroom.
- Demonstrate a location-aware Smart Home alert system.

Equipment and Software

Item	Description
Home Assistant (Docker)	Main automation and control system
ESP32 + ESPHome	Microcontroller connected to sensors
DHT11	Temperature and humidity sensor
MQ-2	Gas/smoke detection sensor
HC-SR501	Motion detection sensor

Item	Description
🔔 Active Buzzer / LED	Alert device
🤖 Telegram App	Notification receiver
🗺️ Google Maps	Used to view sensor locations

System Concept

When an event occurs (e.g., gas leak, motion, or high temperature), Home Assistant sends a Telegram message with a Google Maps link showing the sensor's location.

Example Telegram message:

> ⚠️ Gas leak detected in the kitchen.
>
> 📍 See location on map.

1. Define Sensor Coordinates

- Assign fixed GPS coordinates for each sensor location:

Location	Latitude	Longitude
Living Room	13.9123	100.5211
Kitchen	13.9125	100.5213
Bedroom	13.9126	100.5215

💡 **Tip:** To find coordinates, open Google Maps, right-click on a location ⟶ "What's here?" ⟶ copy latitude and longitude.

2. Add Automation Rules in Home Assistant

- Edit /config/automations.yaml and add the following:

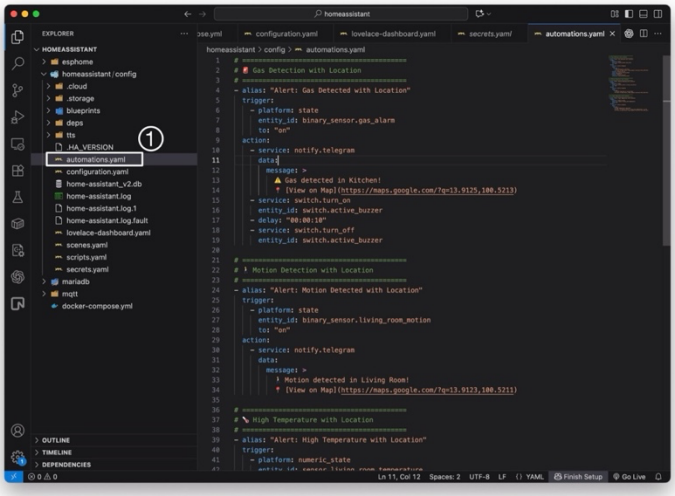
Yaml:

```
# ========================================
# 🚨 Gas Detection with Location
# ========================================
- alias: "Alert: Gas Detected with Location"
  trigger:
    - platform: state
      entity_id: binary_sensor.gas_alarm
      to: "on"
  action:
    - service: notify.telegram
      data:
        message: >
          ⚠️ Gas detected in Kitchen!
          📍 [View on Map](https://maps.google.com/?q=13.9125,100.5213)
    - service: switch.turn_on
      entity_id: switch.active_buzzer
    - delay: "00:00:10"
    - service: switch.turn_off
      entity_id: switch.active_buzzer


# ========================================
# 🚶 Motion Detection with Location
# ========================================
- alias: "Alert: Motion Detected with Location"
  trigger:
    - platform: state
      entity_id: binary_sensor.living_room_motion
```

```
    to: "on"
  action:
    - service: notify.telegram
      data:
        message: >
          🚶 Motion detected in Living Room!
          📍 [View on Map](https://maps.google.com/?q=13.9123,100.5211)

# ========================================
# 🌡️ High Temperature with Location
# ========================================
- alias: "Alert: High Temperature with Location"
  trigger:
    - platform: numeric_state
      entity_id: sensor.living_room_temperature
      above: 32
  action:
    - service: notify.telegram
      data:
        message: >
          🔥 High temperature detected!
          Current: {{ states('sensor.living_room_temperature') }} °C
          📍 [View on Map](https://maps.google.com/?q=13.9126,100.5215)
```



3. Validate and Reload Automations

- Go to Developer Tools ⟶ YAML ⟶ Check Configuration to ensure no syntax errors.
- Then go to Developer Tools ⟶ Actions and execute:

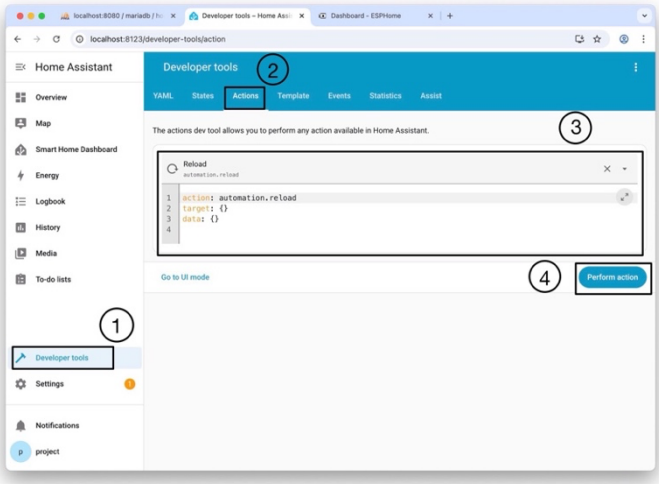
Yaml:

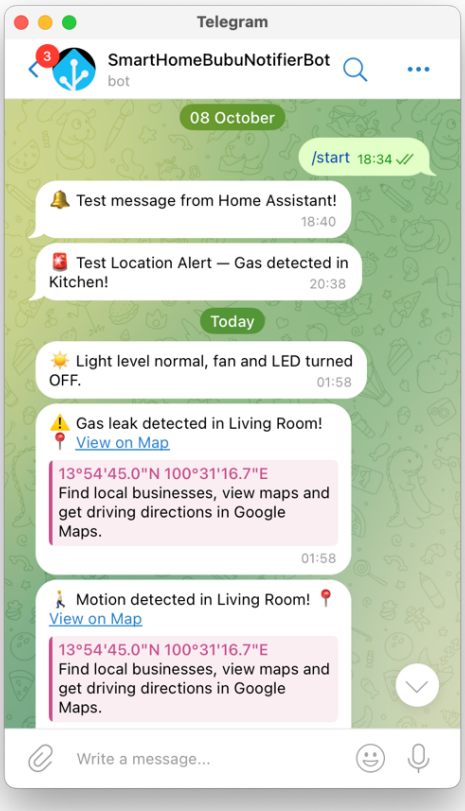
action: automation.reload

target: {}

data: {}

- Once reloaded, your new automations are active ✅





Take 1: Design and Implement a Smart Unified Notification System for Multiple Events

Objective:

To design and implement a location-aware smart notification system in Home Assistant that can detect multiple simultaneous events (Gas Leak, Motion, and High Temperature) and send a single summarized alert to Telegram — instead of multiple separate messages.

Requirements:

1. Hardware and Platform

    • Use an ESP32 or ESP8266 board integrated with ESPHome.

    • Use the following sensors:

    • MQ-2 gas sensor ⟶ detects gas or smoke.

    • HC-SR501 motion sensor ⟶ detects movement.

    • DHT11 sensor ⟶ measures temperature and humidity.

    • All sensors must be connected and registered in Home Assistant.

2. Automation and Notification

    • Create a single automation in Home Assistant that combines all three triggers:

    • Gas sensor (binary_sensor.gas_alarm)

    • Motion sensor (binary_sensor.living_room_motion)

    • Temperature sensor (sensor.living_room_temperature)

    • The automation should:

    • Wait for 5 seconds to ensure all events occurring close in time are grouped.

    • Collect current values of all sensors.

- Send one unified message to Telegram that summarizes all detected events.
- Include the current time and Google Maps location link of the affected area.

Code:

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

Answer:

```
- alias: "Smart Unified Alert"
  description: "Combine gas, motion, and temperature events into one Telegram message"
  mode: single
  trigger:
    - platform: state
      entity_id:
        - binary_sensor.gas_alarm
        - binary_sensor.living_room_motion
    - platform: numeric_state
      entity_id: sensor.living_room_temperature
      above: 32
  action:
    - delay: "00:00:05"
    - service: notify.telegram
      data:
        message: >
          🚨 *Smart Unified Alert*
          🕒 {{ now().strftime('%H:%M:%S') }}
          💨 Gas: {{ states('binary_sensor.gas_alarm') }}
          🚶 Motion: {{ states('binary_sensor.living_room_motion') }}
          🌡️ Temperature: {{ states('sensor.living_room_temperature') }} °C
          📍 [View on Map](https://maps.google.com/?q=13.9123,100.5211)
```