

SIT 210- Embedded Systems Task 4.2HD

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Youtube link –
<https://youtu.be/ZHEMLt8ZISw>

Github link-
<https://github.com/puniaruj/SIT-210--Embedded-Systems/tree/main/Task4.2HDArduinoCloudFunction>

Q - Describe a real-life usage scenario for your system.

The system you created can be really helpful in remote or rural areas where traffic lights are needed, but there isn't enough infrastructure to run them automatically or locally. For instance, in the outback of Australia, where there aren't many cars, there are still times when someone needs to manage traffic, like during construction, at school crossings, or when there are temporary road repairs. A remote traffic light control system would let officials handle traffic from far away without having to set up complicated automated systems. With this system, local authorities can adjust the traffic lights online using the Google Firebase platform. This feature could be super important during emergencies when traffic needs to be changed quickly based on current situations, like road dangers, bad weather, or ongoing construction.

Q - How would you improve this task using other technologies/libraries?

A - Use of MQTT:

- **Improvement:** MQTT is a lightweight messaging protocol ideal for IoT systems.
- **Why it's better:** It provides faster, real-time communication through a publish/subscribe model, making the system more scalable and responsive.

WebSocket for Real-time Communication:

- **Improvement:** Web Sockets allow two-way communication without constant polling.
- **Why it's better:** Reduces delays and improves responsiveness in controlling the traffic lights.

Integration with Cloud IoT Platforms:

- **Improvement:** Platforms like AWS IoT offer features like device management and analytics.
- **Why it's better:** Provides better security, scalability, and real-time monitoring.

Machine Learning for Traffic Control:

- **Improvement:** AI could monitor traffic conditions and adjust lights automatically.
- **Why it's better:** Increases traffic efficiency by reducing manual intervention.