SIT210: Embedded Systems Development

Task 4.2HD Particle - Calling a function from the Web to Device

In task 3.1P, you learned how to read data from your Particle device. At times, when reading data collected by your device online, you might want to trigger an event, call a function, or ask you device to do something. This task is designed to help you learn and figure out how to call a function from web.

Note that this task is an HD task. Hence, the descriptions are predominantly geared towards providing abstract requirements of the deliverable. You are required to invest more in researching and developing the requested details.

Hardware Required

Particle device
Breadboard
LEDs, and jumper wires

Software Required

Web IDE or Particle IDE

Pre-requisites: You must do the following before this task

1) Complete all previous photon tasks (1.2P, 2.1P, 3.1P)
2) Research and read about cloud functions. There is a good reference available on Particle website about Particle Cloud functions and API: https://docs.particle.io/reference/device-os/firmware/photon/#cloud-functions

Task Objective

This task will introduce you to the concept of remotely calling a function from the web to run on your Particle device.

Scenario/requirements: A remote junction in rural Australia is in need of a traffic light. Given remote nature of the area and lack of facilities to implement an automated traffic junction, we are asked by the authorities to design a system that allows them to control the traffic light remotely. We will be using a particle device, and three LEDs to demonstrate a working prototype.

Steps:

1. Complete a simple circuit board using Particle device that includes: 3 LEDs connected to 3 pins on the device that allows you to turn them on and off separately. Label the 3 LEDs with “red”, “green”, and “blue”.
    a. Optionally if you have them, use 3 LED with 3 different colours (red, green, blue)
    b. Alternatively, you might want to use an RGB LED.
2. Write a function on the particle device that takes in a string argument, “red”, “green” or “blue” to toggle the corresponding LED on/off.
3. Expose your method to the cloud using Particle.function() call (you need to research particle docs to see how you can achieve this, including apis and tocken IDs).
4. Create a simple HTML page that has 3 checkbox/buttons form to use to toggle your LEDs on your device.
5. Open the HTML file and use the checkbox to turn toggle the LEDs on your photon.

Task Submission Details

Q1: Submit a video that shows the outcome of the task. Include the link here.

Q2: Create a repository named SIT210-Task4.2HD-ParticleCloudFunction on your Github account. Upload your code to the repository. Include the link to your repository here.

Q3. Describe a real-life usage scenario for your system.

Q4. How would you improve this task using other technologies/libraries?

Remember, anytime you submit a task to OnTrack, it is a good practice to check the status of any existing tasks, and the future tasks you are expected to complete. If you have got feedback on previous tasks, you may need to fix and resubmit some of your work. You want to check out why, so that you can learn from this and make it faster and easier to accomplish later work to the required standard.