Final Project

The final project for the course will provide an introduction to the Internet of Things (IOT) using the Raspberry Pi and the GPIO interface. It addition to C++ programming, it requires the use of a web server, HTML, and either client-side scripting using javascript or server-side scripting using php.

Requirements:

Hardware functions

1. Check status of light. Return boolean: 1 (on) or 0 (off)
2. Turn light on. Return void.
3. Turn light off. Return void
4. Blink light given number of times. Input number of times. Return void.
5. Check temperature sensor. Return integer (temperature in fahrenheit)
6. main() function which calls on all hardware functions.

Command interpreter interface

1. Input command and given parameter (use argc and argv[])
2. Check status of light. Parameter (s)
3. Turn light on. Parameter (o)
4. Turn light off. Parameter (f)
5. Blink light twice. Parameter (b) 6. Check temperature sensor (t)
7. In the case of no parameters, a menu will be displayed with a programming sentinel for terminating program.
8. In the case of an incorrect parameter(s), error message will be displayed and program will terminate.

Web interface

1. Web interface should use radio buttons and a submit button for input/output in executing hardware functions.
2. Web interface provides continuous functioning of program.

Documentation

1. Introduction describing the project.
2. Flowchart and UML diagrams describing the software specifications are required.
3. Hardware diagram specifying wiring requirements and GPIO interface.
4. Source code should provide comprehensive description of all components.
5. Copy of presentation slides

Documentation explanation
One premise of the scientific method is that all experiments can be repeated. When writing a scientific manuscript, it is essential that documentation is written with enough detail so another researcher can repeat the experiment.

As a software developer, one's work needs to be adequately documented so that any other professional in the field has enough information to reproduce it. Keep this in mind when working on this development project. This is an excellent opportunity to showcase your work for a portfolio. You may also want to consider the use of GitHub or other software archives.