E5IoT project

Purpose

The purpose of this project is to apply certain theoretical topics, from the course, onto a specific project.
The project runs through the entire semester.
You must design an IoT artefact, composed of embedded hardware, embedded software, sensors, and actuators.
You IoT artefact shall be capable of performing a meaningful task, better, that a similar device, that is not connected to the internet.
That could be anything from "a smart plant watering systems, that takes into account the weather forecast, sunshine hours, etc, " to a " streaming music device that plays music depending who is present" or perhaps an intelligent industrial sensor, or something completely different.

Documentation

A written project report must be handed in, including as minimum
Introduction
Project description
Requirements analysis
System design
Implementation
Test/Verification
Conclusion
The project report must be uploaded to digitalEksamen, in pdf format.
In the report you are welcome to include links to videos, that contain supporting information, such as demonstrating your artefact is working, selected verification tests executed or other relevant supporting information.
The pdf report must contain the primary information.

Teamwork

You are allowed to work in teams of upto 3 persons.
In your project documentation, is must be clearly stated what topics the individual team members have worked with

Requirements

Functional requirements

1 The device must be able to connect to the internet
1.1 Internet connection shall be via WIFI
1.2.The device should preferably be able to connect to AU's "AU Gadget network"
2 Your device must be able to read data from a connected sensor, local to the device
2.1 a sensor can be anything that quantifies a physical measure, into an electrical signal, such as temperature, light, humidity, presence, movement, magnetism, pollution, etc.
3 Your device must be able to control an actuator
3.1 An actuator can be anything that translates an electrical signal into a physical quantity, such as, motors, servos, valves, heaters, displays, lamps, etc.
4 Your device must be capable of using data from a web service, to augment "what it does", this could be weather data, traffic data, stock prices, twitter feeds, emails, rss-feeds or something different.
5 Your software and hardware design must be shared
5.1 You must create a public github account, and add relevant project files here
5.2 Hardware documentation, schematics, datasheets and pcb layouts are to be uploaded in pdf format

5.3 Software files are to be uploaded in raw source code format, e.g. .C, CPP, .h, .py, etc.

Techical requirements

1 The technical platform can be a suited embedded platform of your choice, e.g. the Particle Photon, an ESP8266, a raspberry pi, beagle bone black or similar.

1.1. The platform shall have Wifi connectivity

1.2. The platform shall have available digital or analog I/O con connect sensors and actuators

Timeframe

week 37 - approval of your project description and design requirements

week 38-43-47- Short presentations of the project progress

week 50 - upload of your report, final source code and documentation to github etc.

At the exam

The exam is oral

At the exam you are expected to give a short (maximum 5 minuttes) presentation of your project.

Since we have been reading the report, you should focus on presenting the key findings, or selected interesting topics at the exam, perhaps a novel way of solving a technical problem.

You can expect the project report to weigh app. 50% of your exam grade, and question in the remaining curriculum to weigh the remaining 50%