Student Name : Cathal Henchy

Project Repo URL : <https://github.com/cathalohinse/Caonach>

Video (Overview) : <https://www.youtube.com/watch?v=EbL4rYfTio8>

Video (Simulation) : <https://www.youtube.com/watch?v=zWSEbet7TJ8>

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Grade Band | Combined Knowledge | Networking Technologies | IoT Solution | Communication |
| Base | Successful connection between RPI sensehat and a Smart Plug, demonstrates a basic understanding of Computer Networks. The inclusion of code that can perform calculations on the data gathered by the sensehat, demonstrates a basic understanding of Programming. | This solution includes the communication via WiFi, between a RPI and a Smart Plug (with a few intermediary devices in between). | An atmospheric sensor device (Sensehat) is used to measure temperature & humidity, and send commands to a smart plug based on calculation of the data measured. | [GitHub Repository](https://github.com/cathalohinse/Caonach) contains a descriptive Readme file, and I have also made a [video](https://www.youtube.com/watch?v=EbL4rYfTio8) that provides an overview of the system, and a [video](https://www.youtube.com/watch?v=zWSEbet7TJ8) that demonstrates a simulation of the system. |
| Good | I had begun to implement a system whereby the outputted data could be stored on a Realtime database (Firebase), and Mongodb queries could be called (aggregate), which would further analyse this data, to determine how long the device was switched on for. | Communication takes place between the RPI and the smart plug, via my home WiFi router, which uses the 802.11g protocol (on the physical layer), and ip on the network layer (DHCP applies static ip addresses – with a very annoyingly short lease time – to both end devices). The data (application layer) is transported via http (which is encapsulated using TCP on the transport layer). The failed Firebase aspect, would have used websockets on the application layer, and probably udp on the transport layer. | An atmospheric sensor device (Sensehat) is used to measure temperature & humidity, and send commands to a smart plug based on calculation of the data measured. | [GitHub Repository](https://github.com/cathalohinse/Caonach) contains a descriptive Readme file, Powerpoint presentations and notpad versions of all attempted code that was written on my RPI and VM. And I have also made a [video](https://www.youtube.com/watch?v=EbL4rYfTio8) that provides an overview of the system, and a [video](https://www.youtube.com/watch?v=zWSEbet7TJ8) that demonstrates a simulation of the system. |
| Excellent | I never got to demonstrate a deep knowledge in practise, throughout this project attempt. | Communication between the RPI and the Smart Plug via Wifi. However no other end to end communication has been achieved fully (failure of Firebase attempt). | An atmospheric sensor device (Sensehat) is used to measure temperature & humidity, and send commands to a smart plug based on calculation of the data measured. | The excel file that outlines how the Device Trigger data was calculated is included in the [GitHub Repository](https://github.com/cathalohinse/Caonach). |
| Outstanding | I did not achieve this. | As per explanation outlined in ‘Good’. | This solution – even if fully realised – is not up to the standard of warranting a job offer. However, it is certainly a novel solution, as there is no such system in place that I’ve ever heard of, that is focused on maintaining vacant buildings in this manner. | I never got as far as writing a platform for this. I had wanted to have a very simple web app, that could have been very quickly and easily written up. |

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Additional Comments:

Hello Frank

Due to a number of issues, this is all that I’ve been able to complete for Assignment 2.

Earlier in the semester, I got a new job, and relocated from Offaly to Cork. Taking on a much more demanding role, coupled with the disruption of relocating etc. set me behind by a few weeks. As of week 10, I was still only on week 3 in terms of lectures for CS&N, and therefore had to do a lot of intense work to get up to speed with the content of the course. Over the course of time between week 10 and the exam, I immersed myself in the content, to develop a very good understanding of what initially looked very abstract to me, and thus achieved a (predicted) result of ~86% (I should have got even higher, as I accidentally selected the incorrect option for 2 of the 5 questions that I have predicted to have gotten wrong), which meant that I was very much set up for success for the IoT Assignment (Assignment 2).

However, the Smart Plugs that I had ordered off Amazon (I was obliged to buy online at the time due to restrictions), took 6 weeks to arrive, and then on the week before Christmas (the week of the exam), I was told by Amazon that they had gone missing, so I had to buy a smart plug last minute in Woodies. This Smart Plug (BG) proved to be very difficult to work with, and it did not seem to have a public API that I could work with, so I had to communicate with it via IFTTT. As I was then at home in Clare for the Christmas, and the WiFi in my apt. in Cork is currently gone (due to upgrades taking place there by my landlord), I was obliged to work with an extremely slow WiFi for the assignment over the holidays. I had initially hoped to work at my friend’s house in Limerick to exploit his fast internet, but restrictions prevented this. I have spent days now going absolutely nowhere as a result. It could take several hours to connect to my rpi some days, and sometimes I can go several days in a row with no access to the Smart Plug. There have even been full days where the internet disappeared completely (both home ISP, and Mobile tethering), which is why I was able to complete my Mongodb assignment (no internet was really needed for this) and I was able to put so much effort into data analysis on excel (which is of no real benefit to demonstrating my knowledge of Computer Networks). The biggest problem encountered was maintaining connection with my rpi, the connection barely ever lasting more than 5 minutes before freezing completely, forcing a reboot. While the connection was maintained, the delayed response to any keypad input, made it fairly difficult to work with.

At this stage, I am throwing in the towel, as I need to get back to addressing other aspects of my life before I get back to work, and I am now exhausted from this and very wary of getting off to a very difficult, resentful start to Semester 3. I am going to hand in what I have done up to now, which is essentially a start on every aspect of what I wanted to do, but nothing really followed through with unfortunately. I will also include a short video, and a very flimsy attempt to grade my work. I think that given the rubric laid out before me, I am entitled to a mark within the Base Grade but I will outline the absolute best case scenarios whereby I could hypothetically reach the Good Grade.

Regards

Cathal