IOT Applications CA-1

Luke Captain x14742841

https://www.youtube.com/watch?v=KmrVWfoIFd8

# Degree of Control

The raspberry pi is controlled using and Android Application written using the Ionic Framework. The application is able to control whether each is sensor is on or off as well as controlling the rate at which the data from each individual sensor is pushed to Firebase using a simple range slider in the UI. On load the app pulls the initial state of the each sensor from firebase and adjusts the UI accordingly (is the sensor is registered as off, toggle the sensor in the UI off. If the pushRate is set higher that 1 set the slider to the pushRate).

# Error Handling

## Android application

The error handling in the android application is done by Ionic itself and also through the use of default values to set the UI controls.

## Java Application

In the Java application error handling is achieved via try catch blocks that either set default values for data if it it returns malformed to ensure that the charts can still render. Additionally non essential data is cast to string to prevent any issues when loading to charts. If firebase encounters an error or returns any connection issues it presents the user with the option to close the application. If the user picks yes the application exits. If the user picks no, the application will not exit allowing the user to view previously pull data but the application will not continue to pull new data and will require a restart. This is done to ensure that the firebase quota is non passed. On return of error from firebase, the application will attempt 5 times to pull the data again before giving the user to shutdown option.

## Raspberry Pi

To prevent connection issues with the raspberry pi to firebase, all data pushes are delayed by at least 2 seconds (1 + pushRate that is set by user via the android app), this allows the threads to execute properly. Additionally if the there is an issue with a sensor it will not push empty or placeholder data it will simply try again to get the data.

# Communication Mechanism

The communication mechanism used throughout the project is Google Firebase’s real-time database which is accessed on all three platforms using the firebase api wrappers for python, java and android.