Meeting 2
1/24
Jack Walsh

Recapped meeting with maintenance

- Maintenance informed us about problem with stagnant water in pipes
- Showed us how the inside of the units are layed out
- Determined that our probe needs to be closest to the window
- Considered mounting the device either inside or outside the casing
    - Maintenance strongly recommended no external parts
    - We want as little room for failure as possible
- Considered the difficulty of getting power into unit
    - Determined the best option is to use a battery
- Determined that our device will need to withstand continuous temperatures of 165-180 degrees Fahrenheit
    - Will determine our part selection
        - May use heat shielding, in which case the temperature sensor will need to extend beyond the casing
- Consider using a magnet to attach the device to the unit wall
    - Need to determine which metal it is made of
- Consider using a device to convert the heat in the unit into power to recharge the battery
- Unit doesn't burst until the water melts again, so the exact timing is unknown
    - Should set the threshold fairly to the sensitive side
        - Expect students not to have their room colder than about 50 degrees Fahrenheit
- Testing the temperature sensor will be necessary

Discussed component selection

- Debating whether Wi-Fi controller should be built into our chip
- Looking at temperature sensor
    - Determining power drain from spec sheet (on the order of μA)
        - Need only consider the winter months
    - Thermometer should work for us
- Microcontroller
    - Have list of 4-5 microcontrollers with Wi-Fi on chip
    - Antenna will be necessary, but they aren't very effective in a metal shielded box
        - Will determine where in the unit the device will be mounted
- Board design
    - The 50 Ω trace will be very wide, Dr. Fay has method to rework the trace to take up less space by making it more complicated
    - Other option is using a two-layer design
    - Chip antennae are available
        - Is a balancing network required? Most likely.
    - Parts should be just below our maximum temperature

        - Most likely the temperature coming out of vent will be less than 85 degrees Celsius
    - ESP8285 chip in stock on Adafruit
        - Professor has some to play with
            - Both on-board and individual
        - If using this chip, shouldn't need PIC at all
        - Must decide which environment to write the code in
            - Consider Platform I/O, frontend for Adam or Visual Studio
            - Arduino ports limit portability
            - Known issue with deep sleeping the 8266 chip
    - Flash is definitely necessary for the chip (just nonvolatile memory)

Web app stuff

- Alert student or maintenance?
    - Student is more likely to quickly fix the situation
    - Critical alerts should definitely go to both