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CS 350 Emerging sys Arch & tech

Final Project Reflection

When making or trying to make a thermostat with a microcontroller, it must have the ability to support I2C for it to read from the temperature sensor, it also needs GPIO in order to control the LEDs, the ability to use GPIO interrupt so that the two buttons can be used to increase or decrease the desired temperature, and finally it needs the ability to use UART so that it can send data to a server to control a heater. In addition to this it also needs to be able to connect to the WI-FI and also have enough RAM to run the code required.

From the fact that we did this project on a Texas Instruments CC3220SF-LAUNCHXL it is clear that it supports all of the requirements that I listed above. Some of the obvious good things about this board in particular is that it had a Wi-Fi module that allows it connect to a “server” in the cloud as well as having 256Kbs of RAM which is enough for this specific project.

When looking at the Microchip offerings, I found the “WFI32-IOT Development Board” which after looking at what it offers and what it can support would work for this project, I can say this as it seems as though this microcontroller has the ability to control LEDs, has user configured buttons, it has an on-board temperature sensor and finally it has the ability to connect to Wi-Fi networks. In addition to this it also has support for GPIO, I2C, and UART.

# When looking at the NXP offerings, I found the “88MW32X 802.11n Wi-Fi® Microcontroller SoC” which has all the offerings of the other two examples, particularly the ability to control LEDs, the ability to connect to Wi-Fi networks, has support for GPIO and UART. The device doesn’t have a temperature sensor on board or any physical buttons. So I don’t find that this would be useful as a candidate for the prototype.

# From what I can tell all of these microcontrollers provide software that make it easy to code for and make the boards have the ability to connect to the internet. But like I said the NXP board won’t work for what we want as it doesn’t have any physical buttons or LEDs to show if the heat is on.

# The flash and RAM on all of these microcontrollers seem to be up to the task of having the code stored in the flash of them, and so that it can be retrieved when needed by the board. And the RAM is used to store the code that is currently being ran by the microcontrollers such as storing the variables or the values for the thermostat.

# References:

*88MW32X Wi-Fi® microcontroller SOC*. NXP Semiconductors. (n.d.). https://www.nxp.com/products/wireless-connectivity/wi-fi-plus-bluetooth-plus-802-15-4/88mw32x-802-11n-wi-fi-microcontroller-soc:88MW32X

*CC3220S-LAUNCHXL*. CC3220S-LAUNCHXL Development kit | TI.com. (n.d.). https://www.ti.com/tool/CC3220S-LAUNCHXL

WFI32-IOT Development Board - Microchip Technology. (n.d.). https://www.microchip.com/en-us/development-tool/EV36W50A