Final Project

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The thermostat in the CC3220S LAUNCHXL uses a sensor on the board to detect the ambient temperature around the sensor to determine the temperature to send back to the program. The thermostat uses the GPIO functionality to allow for the temperature setpoint to be changed by pressing one of two buttons to raise or lower the setpoint in the code. The UART driver is used to send information from the sensor of the LAUNCHXL to the program code to perform actions, as well as to send information to the board to turn on the LEDs when the temperature is below the setpoint or turn it off when above the setpoint. The I2C driver allows the thermostat to communicate with the program code and vice versa, creating a path for the program to perform its tasks based on the conditions that have been laid out in the code.

The TI CC32220S LAUNCHXL hardware architecture features an Arm Cortex-M4 MCU with 256KB of RAM and 1MB of serial flash memory. The network processor MCU is what allows the Wi-Fi to function and connect to the cloud for data transfer. The Microchip SAM-IoT WG Development Board contains an Arm Cortex-M0+ which, much like the CCS3220S, has 256KB of flash memory and 32KB of SRAM. It has Wi-Fi connectivity that allows it to connect to the cloud through the ATWINC1510 Wi-Fi network controller. Finally, the Freescale, now NXP, microcontroller, LPC541xx, has an Arm Cortex-M4 MCU that contains up to 192KB of Ram with up to 512KB of flash memory. This development board, however, does not include a Wi-Fi connection functionality. Therefore, connection to the cloud is only possible through a wired connection.

References

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NXP, (N.D.), Low-Power Microcontrollers (MCUs) based on Arm Cortex-M4 Cores with Optional Cortex-M0+ Co-processor, https://www.nxp.com/products/processors-and-microcontrollers/arm-microcontrollers/general-purpose-mcus/lpc54000-arm-cortex-m4-/low-power-microcontrollers-mcus-based-on-arm-cortex-m4-cores-with-optional-cortex-m0-plus-co-processor:LPC541XX