**Project 1**

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Successfully creating a thermostat requires a microcontroller that must fulfil a few basic requirements. Reading room temperature, controlling settings via button input, sending data to a server, connecting to Wi-Fi, and making use of LED lights are all capabilities that the microcontroller must posses to duplicate this project. The Texas Instruments CC3220 series microcontroller fulfills these requirements as it supports I2C for reading room temperature, UART for sending data to a server, can connect to Wi-Fi, and uses GPIO for LED control. For these reasons, the CC3220 series microcontroller was chosen for this implementation.

One of the requirements listed for this project is the necessity of connecting to the cloud. As noted previously, the CC3220 microcontroller can meet this requirement. “The SimpleLink™ Wi-Fi® Internet-on-a chip™ family of devices from Texas Instruments™ provides a suite of integrated protocols for Wi-Fi® and Internet connectivity to dramatically simplify the implementation of Internet-

enabled devices and applications” (Texas Instruments, 2020). In the case of this project, we are using the UART peripheral to output thermostat data to the terminal and simulate a cloud connection.

Another necessary requirement for any project is to ensure the hardware contains enough memory to fulfil its duties. In this case, the CC3220 microcontroller has 256KB of SRAM and 1MB of executable flash memory. The SRAM will serve as temporary memory that is lost when power is lost. In low-power mode, a developer can choose to retain a small portion of the SRAM memory to help provide a fast wakeup process. Flash memory is a more permanent memory and will not be lost when power is lost. This is used for code and constant data sections.

With the TI CC3220 microcontroller, and all the components it possesses, we were able to successfully develop a thermostat capable of reading room temperature, use button inputs to raise or lower the temperature, and record the data to the cloud.

**References**

Texas Instruments. (2020, October). SimpleLink Wi-Fi CC3x20, CC3x3x Network Processor. https://www.ti.com/lit/ug/swru455m/swru455m.pdf?ts=1715231850659