CS 350 7-1 Final Project: Thermostat Lab Report Reflection

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Peripherals used in this project for the thermostat are the UART, GPIO, Timer, 12C, peripherals. These are varying inputs and outputs that make the thermostat work properly. The UART makes the thermostat output what state the system is in in the terminal. This simulates connecting to the cloud. 12C reads the information from the temperature sensor which is located a part of the Raspberry Pi device. This device accurately reads temperature and humidity. The timer peripheral ensures that all assigned tasks are executed at the correct times. This helps to keep everything run smoothly. The GPIO handles the three button inputs to increase or decrease whatever the user wants by pressing a button to lower or increase the thermostat.

The thermostat can connect to the cloud via WIFI, allowing users to control and monitor when not at home. Microchips and Freescale offer such solutions if you choose. For example, Texas Instruments offer microchips with WIFI capabilities. The architecture chosen must have enough Flash and RAM to support the code. Freescale which is now a part of NXP semiconductors can help with this process. Raspberry Pi offers many different options to connect to WIFI. Thay all include software to make it easier. It is up to what the user prefers to use.

Having enough flash and ram are important to support the code. They are key for the microcontroller to support code and data storage. The flash serves as a place for the code to be stored when it needs to be executed. Secondly, the ram holds the code currently being executed by the microcontroller. This executes the variables and values being used in the written code.

References:

Nxp-Electronics.com. (2025). *Freescale Semiconductor, Inc. (NXP Semiconductors) - Nxp-Electronics.com*. Nxp-Electronics.com. <https://www.nxp-electronics.com/manufacturer/Freescale-Semiconductor>

*Raspberry Pi Documentation - Microcontrollers*. (n.d.). Www.raspberrypi.com. https://www.raspberrypi.com/documentation/microcontrollers/

*Wi-Fi products | TI.com*. (2025). Ti.com. https://www.ti.com/product-category/wireless-connectivity/wi-fi/overview.html