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CS 350

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Final Project Report

The TI CCS3220S microcontroller is the microcontroller used for this project, and it supports I2C for reading a temperature sensor, GPIO for controlling LED lights, and UART to send data from the microcontroller, in this case temperature, to the server. The TI microcontroller can connect to Wi-Fi and could be used to connect and communicate with a server. The TI board also has 256kb of ram which is sufficient to support the required code (*CC3220 SimpleLink™ Wi-Fi® and Internet of Things Technical Reference Manual* 2017).

Microchip’s WFI32-IoT also supports I2C for reading temperature, GPIO for controlling user LEDs as well as RGB LEDs, and supports UART with hardware flow control. This board has a temperature sensor connected to I2C and a GPIO for a user-configurable alert output. The board has 256kb of ram which would be sufficient to support the required code (*WFI32-IOT Board user's guide*).

Freescale merged into NXP, another company that produces microcontrollers. NXP’s LPC55S6x microcontroller supports UART interfaces for the LEDs, I2C for temperature reading, GPIO for data communication and connects to Wi-Fi. The board also has 320 RAM, which is sufficient to support the required code (*LPC55S6X*).

The microcontrollers listed above from TI, Microchip, and NXP all support the requirements and interfaces needed for the next step. The board of NXP has an advantage over the others considering there is more RAM available. The Microchip board unfortunately has less LEDs than the others but has an alert output through GPIO connected to the temperature sensor. The amount of LEDs needed and a decision based on if an alert output is needed would help make a final decision on the board, but I recommend the board by Microchip since there is an alert output.

References

Microchip. (n.d.). WFI32-IOT Board user’s guide. <https://onlinedocs.microchip.com/pr/GUID-CF40EB84-E833-4658-86DA-5F6DDCDE44D2-en-US-1/index.html?GUID-8D28461B-C524-4F69-9FEF-637EB933C763>

NXP. (n.d.). *LPC55S6X*. LPC55S6x | Arm®Cortex®-M33 | 32-bit MCU | NXP Semiconductors. https://www.nxp.com/products/processors-and-microcontrollers/arm-microcontrollers/general-purpose-mcus/lpc5500-arm-cortex-m33/high-efficiency-arm-cortex-m33-based-microcontroller-family:LPC55S6x

Texas Instruments. (2017). *CC3220 SimpleLinkTM Wi-Fi® and Internet of Things Technical Reference Manual*. Texas Instruments.