Final Project

CS 350 Emerging Sys Arch & Tech

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**Analysis**

To adequately build a thermostat we need to consider which platform, Raspberry Pi, Microchip, or Freescale meets the necessary specifications of a smart thermostat. Firstly, we need to consider what each platform offers in terms of peripherals, Wi-Fi/ cloud connectivity, and Memory in addition to the overall cost per unit.

Raspberry Pi would work well but would also be a bit overkill as it supports HDMI, USB, ports for cameras, audio, ethernet in addition to the necessary items like GPIO, 12C, PWM, and UART. Most Raspberry Pi units come equipped with integrated Wi-Fi easily connecting to the cloud. Depending on which model is used, units can have Flash and ram capacity up to 8GB with 256GB+ of storage. This would easily contain the code needed to run the Thermostat. Units vary in price from about $35 - $90.

Microchips also have the necessary peripherals like GPIO, PWM, and UART, but suffer from limited USB support. Wi-Fi doesn’t come installed with Microchips, so it would be necessary to add the parts necessary to connect to the cloud. The microchip comes installed with a modest 2KB – 215KB of Flash, 128 KB of RAM leaving little room for complex apps. Units sell for about $3 - $10.

Lastly, Freescale has all the necessary peripherals including USB and Ethernet. Some models come equipped with Wi-Fi allowing for cloud integration. Units have a 128KB – 2MB of Flash and 16KB – 512KB of RAM making this platform sufficient for moderately sized coding projects. Freescale units tend to cost $10 -$18.

My recommendation to SysTec is to use Freescale for their smart thermostats. While not as powerful as the Raspberry Pi, Freescale gives the company all the necessary peripherals, connection to Wi-Fi and enough Flash and RAM to support code on affordable devices. Using a Raspberry Pi would cost much more and many of the features would not be fully utilized.

**Citations**

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