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Professor Moscon

**Assignment: Wiring an LED Display**

1. ***Why do you have a sleep command in your loop?***

The sleep command in the loop is there to keep things running smoothly and at a manageable pace. Without it, the display would update too quickly, making it hard to read anything clearly. In this case, it ensures that the display is refreshed at regular intervals to prevent unreadable changes and unnecessary strain on the processor by giving it a break between updates. This essentially allows the system to execute other tasks in between iterations with the display feeling more responsive and user friendly.

1. ***What is the purpose of having a text display on an embedded device?***

Having a text display on an embedded device is very useful for communication between the system and the user. It can show things like status updates, warnings, or even basic operational info, anything that helps users understand what’s going on. Since embedded systems are often used in places where a big screen or fancy graphics aren’t practical, a simple text display gets the job done efficiently. They're compact, power efficient, and easy to use, making them suitable for a wide range of applications.

1. ***How can you think of the display device as something that could relate to a state machine?***

I think of a display as a mini state machine because it moves through different "modes" depending on what it’s doing based on input or instructions. For example, it might start in an "idle" state, switch to an "updating" state when new text comes in, and then return to "idle" once it’s done. Each state represents a specific function or task the display is performing, and it transitions between these based on commands or events just like in a state machine. It’s a logical way to think about how the display operates.

**Reflection**

During the setup of the LCD, I encountered a few challenges that made the process more time consuming than expected. Installing the necessary packages was straightforward, and I didn’t face any issues there. However, when I began assembling the components is when things got tricky. The lab guide instructions were not entirely accurate. At one point, it instructed me to place a wire in Column F, row 49, only to later direct me to plug another wire into the same spot, which was already occupied. In fact, multiple instructions told me to place them in column F, rather than column E. These repeated inconsistencies made me question my progress at multiple points throughout. Initially, the screen turned on and I turned it into one consistent color with the potentiometer, only for the text not to display.

To work through this, I retraced my steps carefully each step of the way time and cross referenced the guide's images with my setup. It was clear that the instructions didn’t perfectly align with the actual assembly requirements, so I relied on the pictures and deduction to resolve the issues. After a lot of patience and some trial and error, I was able to get the screen working. Seeing the text finally displayed on the screen was rewarding, and it validated the effort I put into troubleshooting. While I’m happy with the result, I feel more guidance in the lab instructions would have saved me a lot of time and confusion. I’ve attached a picture below of the instructions, and the image that shows they were incorrect in telling me to place the wires in column F.



