5-1 Milestone Three: Input With Buttons Lab

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1. **Why does the loop that processes the LED blinking need to run in a separate thread?**

The loop that processes the blinking LED runs in a separate thread so it won’t interfere with the remainder of the program's functions, like pressing the button. Using a separate thread allows the LED to blink while the main thread stays responsive to user inputs.

**2. What is the purpose of returning to the off state after each completed state action?**

Returning to the off state ensures consistent changes from dots, dashes, and pauses. This keeps the state machine organized and prevents errors like lights overlapping or remaining on.

**3.How could you integrate serial communications to facilitate changing the messages available to the program?**

Using a serial device could allow communication between a computer and the device. You could use another device to change the message without the need to press a physical button on the device.

**4. How could you use the 16x2 display to provide debugging information to the user when they don’t have access to the application console?**

The display could be used to display the message sent and the characters representing it.

A message like:

**Sending: SOS**

**. . . - - - . . .**

or

**Sending: SOS**

**R R R B B B R R R**

Would assist debugging by showing what signals are sent, and the user verifying the correct light flashes are present.