5-1 Milestone Three

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CS350: Emerging Systems Architectures & Technologies

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December 1st, 2024

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### **1. What is the purpose of the timerCallback() function?**

The timerCallback() function serves as the core mechanism for driving the Morse code state machine. It is triggered periodically by the timer and determines the next action in the sequence, such as turning LEDs on or off to represent dots, dashes, or spaces between characters and words. By processing each timer tick, the timerCallback() function ensures that the timing and order of the Morse code message are accurate. This precise handling of the LED states allows the program to faithfully reproduce the SOS and OK Morse code patterns.

### **2. What does period mean in this context?**

In this context, the period defines the time interval at which the timer triggers the timerCallback() function. For this program, the period is set to 500 milliseconds (500,000 microseconds). This value is significant because it establishes the base timing unit for the Morse code. A dot corresponds to one period, a dash to three periods, and character or word gaps are multiples of this base period. The period directly influences the blinking behavior and ensures the timing matches the Morse code standard.

### **3. How does the Timer\_CONTINUOUS\_CALLBACK parameter impact the driver?**

The Timer\_CONTINUOUS\_CALLBACK parameter configures the timer to operate in a continuous mode, automatically restarting after each period. This allows the timer to repeatedly invoke the timerCallback() function without requiring manual intervention to restart the timer. By enabling this mode, the program can maintain a steady rhythm for Morse code processing, ensuring consistent timing for all LED states and transitions.

### **4. What is gpioButtonFxn0() used for?**

The gpioButtonFxn0() function is the interrupt service routine (ISR) for Button 0. When this button is pressed, the function toggles the message between SOS and OK. However, the toggle does not interrupt the current Morse code sequence; instead, it queues the new message to start after the current one is completed. This behavior ensures the integrity of the Morse code message while allowing the user to switch between patterns seamlessly.

### **5. What is the purpose of GPIO\_CFG\_IN\_INT\_FALLING?**

The purpose of GPIO\_CFG\_IN\_INT\_FALLING is to configure the button's GPIO pin to generate an interrupt when a falling edge is detected. A falling edge occurs when the signal transitions from high (not pressed) to low (pressed). This configuration ensures the program responds to button presses promptly and accurately, triggering the gpioButtonFxn0() function only when the button is physically pressed.