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EMBEDDED SYSTEM DESIGN (E3-257)

LAB ASSIGNMENT – 2

Explanation of Code

The code handles LED control based on button presses and a periodic timer. Below is an explanation of the code:

Definitions:

- LED Constants:

  - `led_g`, `led_r`, `led_b`, `led_cy`, `led_y`, `led_mag`, `led_white`, `led_off`: Constants representing different LED colors and states.

- Delay Constant:

  - `delay`: The delay in milliseconds used for controlling LED blink speed.

Function Prototypes:

- `void delayMs(int n)`: Function prototype for creating a delay in milliseconds.

Global Variables:

- `colour_mode`: Integer variable to track the current LED color mode (0 to 6).

- `factor`: Integer variable to control the blinking speed factor.

- `i`, `j`: Variables used for loop control and flagging.

- `flag`: Flag variable used for LED control.

Main Function (`main`):

1. **Initialize GPIO and Interrupts:**

  - Set up the GPIO pins and configure them for digital input/output.

  - Configure PF4 and PF0 as falling-edge-triggered interrupts.

  - Enable NVIC interrupts for PORTF.

2. **Main Loop:**

  - The program enters an infinite loop and continuously checks the value of `colour_mode` to determine which LED color to display.

  - The LED color changes based on button presses (SW1 on PF4).

  - The `delayMs` function is used to control the LED blinking speed.

GPIOF_Handler Interrupt Service Routine (ISR):

- **SW1 (`PF4`) Interrupt Handling:**

  - When SW1 is pressed, it changes the `colour_mode` to cycle through different LED colors.

- **SW2 (`PF0`) Interrupt Handling:**

  - When SW2 is pressed, it modifies the `factor` and `flag` variables, affecting the LED blink speed.

  - `factor` changes between 2, 4, 8, 16, 32, and 1.

  - `flag` is toggled between 0 and 1.

  - `j` is used to track the `factor` state.

  ➔ **Use of Interrupt set to the falling edge helps resolve the de-bounce issue also**