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/**
 * ButtonLED.c
 * This file contains the functions that control the button game LEDs.
 * The LEDs are controlled using a 74HC595 (output) shift register.
 */

#include "ES_Configure.h"
#include "ES_Framework.h"
#include "ButtonLED.h"

#include "inc/hw_memmap.h"
#include "inc/hw_types.h"
#include "inc/hw_gpio.h"
#include "inc/hw_sysctl.h"

/* Prototypes */
void buttonInput(uint8_t buttonNum);
void buttonLightsOn(void);
static void setSerial(uint8_t input);
static void sclkPulse(void);
static void rclkPulse(void);
static void delay(void);

/**
 * Lights an LED corresponding to a specific button.
 * @param buttonNum: number of the button
 */
void buttonInput(uint8_t buttonNum) {
    for (uint8_t i = 1; i <= 8; i++) {
        if (i == buttonNum) setSerial(1);
        else setSerial(0);
        sclkPulse();
    }
    rclkPulse();
}

/**
 * Turns on all button LEDs.
 */
void buttonLightsOn(void) {
    for (uint8_t i = 1; i <= 8; i++) {
        if (i != 7 && i != 8) setSerial(1);
        else setSerial(0);
        sclkPulse();
    }
    rclkPulse();
}

/**
 * Sets the SER (data) line of the output shift register.
 * @param input: data to shift in (i.e., 0 or 1)
 */
static void setSerial(uint8_t input) {
    if (input == 1) {
        SREG_SER_PORT |= SREG_SER_PIN;
    } else if (input == 0) {

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        SREG_SER_PORT &= ~SREG_SER_PIN;
    }
}

/**
 * Pulses the shift clock.
 */
static void sclkPulse(void) {
    SREG_SCLK_PORT |= SREG_SCLK_PIN;
    delay();
    SREG_SCLK_PORT &= ~SREG_SCLK_PIN;
}

/**
 * Pulses the register clock.
 */
static void rclkPulse(void) {
    SREG_RCLK_PORT |= SREG_RCLK_PIN;
    delay();
    SREG_RCLK_PORT &= ~SREG_RCLK_PIN;
}

/**
 * Delays for a short period of time to
 * allow for clock pulses to be detected.
 */
static void delay(void) {
    uint8_t dummy = 1;
    for (uint8_t i = 0; i < 100; i++) {
        dummy = dummy + 1;
    }
}

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